SUPERIOR - DULUTH HARBOR

NATURAL RESOURCES MANAGEMENT PROGRAM

JULY 1985

SUPERIOR-DULUTH HARBOR

NATURAL RESOURCES MANAGEMENT PROGRAM

prepared by the

METROPOLITAN INTERSTATE COMMITTEE

a joint venture of the
ARROWHEAD REGIONAL DEVELOPMENT COMMISSION
and
Northwest Regional Planning Commission

July 1985

Metropolitan Interstate Committee
Arrowhead Center
330 South First Avenue East
Duluth, Minnesota 55802
(218) 722-5545

preparation of this document was funded in part by the State of Wisconsin, Coastal Management Program, Department of Administration, and the Coastal Zone Management Act of 1972, as amended, administered by the Office of Coastal Zone Management, National Oceanic and Atmospheric Administration.

TABLE OF CONTENTS

INTRODUCTION

This document presents the results of work aimed at creating a framework for enhancing the natural resources of the Superior-Duluth harbor. It is intended to bring together a wide range of prior and current work and focus it on key management issues. Recommendations are offered on how to address these issues.

The premise of this report and prior harbor planning efforts is that a balanced use and management program is desirable and achievable for the harbor. While the forces of development have been and remain constantly active, the natural resources parties have only recently become involved. The harbor plan, and now this document, hope to provide a refined context for active natural resources programs.

The underlying premise of this approach is:

> the harbor is a single natural resource entity, but because of development patterns, history, ownership and the state line, it must and can be managed through the coordinated management of key discrete parcels.

Given this framework, twenty management sites have been identified. Some require active management while others need only protection and passive attention. Of those needing direct action, some have been planned with actions already underway. Others need such attention; this document focuses on one of them.

In addition, this report reviews the success of the prior and current programs at Barkers, Hearding, and Interstate Islands. It found success at Interstate, no firm results yet at Hearding, and a lack of success at Barkers.

As a result, the recommendations note that while efforts at Hearding and Interstate should be continued and expanded, Barkers should be de-designated. In its place, the Wisconsin Grassy Point area should be designated and developed; a new island should be created to provide the needed habitat for the target species - common terns and piping plovers.

Thus, the focus is put on undertaking the Grassy Point project. It is "do-able" and fills a critical need. Implementing it must be coordinated with the Barkers Island action.

The natural resources program and recommendations offered in this report help direct efforts to achieving a balance of development and resource concerns in the harbor. They accomplish this objective by assuring that the vital natural resources are managed in a coordinated manner with a mix of active and passive programs.

NATURAL RESOURCES MANAGEMENT SITES

MANAGEMENT CONCEPT

From 1976 to 1978 the Metropolitan Interstate Committee (MIC) developed a harbor plan for the Duluth-Superior harbor, and, in 1978, this plan was adopted by the cities of Duluth and Superior, the Superior Harbor Commission, the Duluth Port Authority, the Arrowhead Regional Development Commission (Minnesota), the Northwest Regional Planning Commission (Wisconsin), and MIC. The plan is a comprehensive land use and management plan for the harbor, and as such includes overall goals, policies, and objectives relevant to the various uses and issues of the harbor (e.g. marine development, natural resources, recreation, etc.).

The natural resources recommendations contained in this report are those portions of the Harbor Land Use and Management Plan dealing with natural resources, and their adoption will constitute a formal amendment to those segments of that plan. It is another purpose of this report to provide guidelines for the active management of the most important natural resources sites in the harbor. The positive and active management of these sites is considered paramount to the maintenance and enhancement of the natural resources of the harbor. Although sites not included in this program are considered of lesser importance or are unknown, their value from a natural resources perspective will continue to receive consideration via existing permit and zoning procedures.

The area included in the program is delineated in the 1978 version of the Land Use Plan and includes that portion of the St. Louis River extending from Lake Superior to the Fond du Lac dam and the lands which immediately adjoin this section of the river (within approximately 1/4 mile of the shoreline). It includes the entire St. Louis River estuary as well as the adjacent shorelands. Although they technically are different, the terms St. Louis River estuary and Duluth-Superior harbor will be used interchangeably.

The assumptions used in the development of this program include:

1. Holistic Approach

   The basic premise is that sound resource management is best developed at the highest hierarchical level for which adequate information is available. In the present case, the functional unit or geographic area used in determining policies and recommendations is the St. Louis River estuary. Therefore, although the plan is primarily expressed through management recommendations for discrete parcels, these recommendations have been made from the perspective of the entire estuary.

2. Enhancement

   This program also assumes that management of natural resources implies more than protection or maintenance of the status quo. Although the maintenance approach is appropriate and perhaps the only management tool available at times, when dealing with a highly

developed and perturbed system which has sustained major losses, enhancement or improvement efforts must play an important role. Management which is limited to only protection or preservation of existing resources can result in the eventual loss or degradation of those resources. Industrial, commercial, and other land and water uses sometimes are incompatible with optimum conditions from a natural resources standpoint, and pressure from these sources can culminate in losses. Enhancement must be a major consideration in the development of mitigation and/or compensation plans.

3. Habitat Management

The emphasis of the program is on habitat management since it is of underlying importance to the management of the natural resources of the area. Since actual implementation takes place on a site-specific basis, the plan has been formulated as a coordinated management scheme for key parcels located throughout the estuary.

Indicative of the systems approach, the key parcels which are included in this program are all viewed as components of a single although disjunct wildlife management area. This composite management area is to be managed according to the general objectives and guidelines developed for the estuary. More specific management recommendations have been developed for each component parcel reflecting its particular importance and role in the overall program.

Due to marked differences in the degree and type of past development, the estuary is usually thought of as divided into upper and lower segments. In general, the lower estuary is highly developed and is dominated by industrial and shipping facilities. In contrast, the upper estuary is relatively undeveloped. The boundary between these two segments lies in the area of the former Arrowhead Bridge, and, for the purpose of this program, the former bridge has been used to demarcate these two regions.

The overall character desired in the upper and lower portions of the estuary are different. With the exception of existing areas of development and those few sites which are noted as potential development sites in the 1978 Land Use Plan, the upper segment is to be maintained in a relatively undeveloped state. In contrast, the lower estuary is for moderate to high intensity development and the primary area for industrial facilities.

This difference in policy regarding the upper and lower estuary does not affect the recommendations made for the key parcels which comprise the wildlife management area proper. Management of these parcels is based solely upon their importance to the natural resources of the estuary and not their location with respect to upper and lower estuary. However, it is implied that the application of zoning and permit programs in those areas not included in the key parcels will reflect this difference in overall objectives for the two portions of the estuary.

The specific criteria used in the selection of key parcels are presented later in this chapter. In general, the methodology used was:

1. Those factors or natural resource "elements" considered important were determined. The rational for inclusion of the various elements

is developed in the sections describing the present resource base of estuary. They strongly reflect the overall management objectives outlined in the land use plan.

2. These factors were used to determine which parcels are of special value and the optimum use of each.

3. Each parcel was examined in terms of the feasibility of attaining the desired resource status, and overall objectives for the site were developed. Important factors in addition to purely resource considerations included present ownership, uses, and cost of implementation.

4. The last step involved developing specific recommendations for each parcel. These include comments pertaining to the administration and the actual physical management of each parcel.

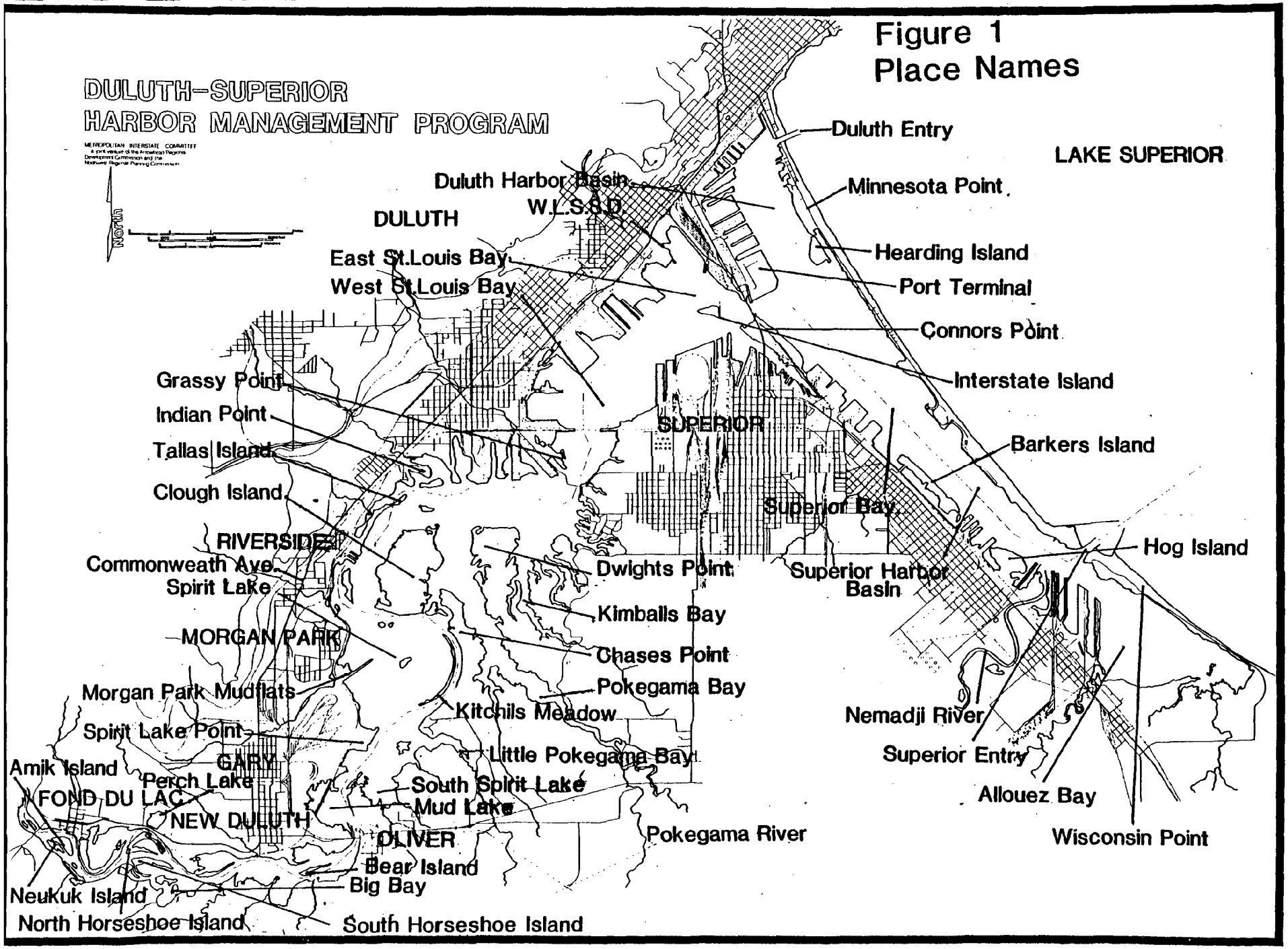
DESCRIPTION OF ESTUARY

The following is a general description and history of the estuary (including the major changes which have occurred with respect to the natural resources) and a synopsis of the present resource base of the area. The latter emphasizes those features considered particularly valuable and summarizes problems, potential improvements, and research needs. While it is beyond the scope of this document to present a detailed, comprehensive literature review concerning the natural resources of the estuary, the information given herein serves to put the management program in context and to present the basic information or criteria upon which the selection of key parcels and development of management recommendations for each are based.

The St. Louis River estuary and adjoining shorelands comprise a large, diverse, and complex geographic area. The estuary lies at the western tip of Lake Superior and consists of the drowned river mouth of the St. Louis River (Figure 1). It serves as a boundary between the states of Wisconsin and Minnesota, and two municipalities, Duluth, Minnesota, and Superior, Wisconsin, border it. The area under consideration in this plan includes approximately 21,000 acres, half of which is water and/or aquatic environs and half of which is upland habitat.

There are major differences in physical character and degree of development in the various portions of the estuary, and thus it often is divided into upper and lower segments. For the purposes of this document, the upper estuary refers to that segment lying above the former Arrowhead Bridge and the lower to that portion downriver of this bridge.

The lower estuary, downstream of the former Arrowhead Bridge, is highly developed - primarily with industrial and shipping facilities. Little of the "original" or pre-development habitat remains, although Allouez Bay, a large shallow bay with extensive marshes and mudflats, probably approximates its pre-development state. Most of the open water areas have been altered in that they have been dredged to a depth of 27 feet. Areas adjacent to the dredged channels generally are shallow and have little vegetation. Most of the undeveloped shoreland is sandy, and the upland vegetation is generally in


DULUTH–SUPERIOR
HARBOR MANAGEMENT PROGRAM
METROPOLITAN INTERSTATE COMMITTEE
a joint venture of the Arrowhead Regional Development Commission and the Northwest Regional Planning Commission
North
Figure 1
Place Names
Duluth Entry
LAKE SUPERIOR
Duluth Harbor Basin
W.L.S.S.D.
Minnesota Point
DULUTH
Hearding Island
East St.Louis Bay
West St.Louis Bay
Port Terminal
Connors Point
Grassy Point
Interstate Island
Indian Point
SUPERIOR
Barkers Island
Tallas Island
Clough Island
Superior Bay
RIVERSIDE
Hog Island
Commonwealth Ave.
Dwights Point
Superior Harbor Basin
Spirit Lake
Kimballs Bay
MORGAN PARK
Chases Point
Pokegama Bay
Morgan Park Mudflats
Kitchils Meadow
Nemadji River
Spirit Lake Point
Little Pokegama Bay
Superior Entry
GARY
Amik Island
Perch Lake
South Spirit Lake
FOND DU LAC
Mud Lake
Allouez Bay
NEW DULUTH
Pokegama River
OLIVER
Wisconsin Point
Bear Island
Big Bay
Neukuk Island
North Horseshoe Island
South Horseshoe Island

early successional stages indicative of disturbed conditions.

The upper reaches of the estuary, which extend from the former Arrowhead Bridge to the Fond du Lac dam, are quite different on the Minnesota and Wisconsin sides. The Wisconsin shore is relatively undeveloped and is predominantly composed of bays, backwaters, and extensive marshes. Generally, the banks are steep and formed of a mix of sand and red clay. The adjoining upland areas are predominantly forested land and include some stands of red pine. Several residential developments are scattered along this shore and include Billings Park, Oliver, and several smaller, less intensively settled areas. In marked contrast, the Minnesota side includes extensive areas of residential development and has been altered by fill operations and some industrial development. Nonetheless, significant marshes and open water areas do exist, especially at Spirit and Mud Lakes and in the Fond du Lac area.

Water depths in the main channels of the upper estuary rang from 3 to 25 feet. In the past, some dredging has occurred as far upstream as Spirit Lake, but current dredging activity is limited to the waters downriver of the docks just above the former Arrowhead Bridge. Most of the river is shallow and, even in the main channels, slow-moving. Numerous islands are present in this section of the river, and they divide it into a network channels and backwater areas in the area upstream of Oliver. The only fast-moving river section is found immediately above Fond du Lac and extends to the first dam. Technically, this section is not part of the "estuary" but is included here since this area plays a vital role with respect to the walleye fishery of the estuary and the dam is a convenient boundary.

Upland vegetation in the upper estuary is predominantly aspen or birch forest, although areas of old field and coniferous forest are present also. These hardwood areas are primarily second-growth stands of Populus species interspersed with several other tree species including red maple, sugar maple, mountain ash, northern red oak, balsam fir, white spruce, white cedar, American elm, mountain maple, red pine, and white pine. Important exceptions include a few small areas of virgin white and red pine present on the Wisconsin shore. Above Fond du Lac, maple-basswood type forest is the predominant habitat type. Grassy meadows and weedy fields are also common.

The lower estuary or harbor proper has undergone a dramatic transformation since man first came to the area. Human habitation of the area began when various Indian tribes settled the area. But they did little to change the landscape. Nor did the initial wave of white traders and missionaries significantly alter the area. Since 1861, however, drastic changes have occurred.

When the harbor was first charted in 1861, there was a single shallow entry, a half-mile notch about three miles from the base of Wisconsin point. The harbor itself was shallow throughout with few soundings exceeding eight feet except where the wandering river channel, 15 to 20 feet deep, criss-crossed the bay. What is now the highly developed harbor was then a huge swamp with a few floating bog islands. The inner points (Rice's and Connor's) were low and swampy, and the river itself, intermittently shallow and dotted with bog islands, meandered its way through the area. Except for the two outer points (Minnesota and Wisconsin), the bulk of the shore was low and marshy or, in the upper reaches, marsh fringed with steep forested banks.

As the cities of Duluth and Superior grew, and as their dependence on the shipping industry expanded, the waterfront changed from marsh to bulkheaded dry land. Extensive stretches of open water and marsh became docks, streets, and shipping facilities. Other areas were filled or altered for residential development, recreation, or simply to dispose of dredge material. The Wisconsin DNR has estimated that since 1861 over 3,300 acres of marsh and open water in the lower harbor have been filled, and an additional 4,000 acres have been dredged. This is out of an approximate total of 12,000 acres. Thus less than 5,000 acres remain which have not been drastically altered, and most of this is located in the upper estuary. The only large wetland area remaining in the lower estuary is in the Allouez Bay area. In large sections of the lower harbor, all of the original habitat has been filled or permanently altered. Water quality dropped markedly during this time also, and this only exacerbated the losses already mentioned.

Upland areas in the lower estuary were similarly affected. With a few important exceptions, little native vegetation remains. Most upland vegetation in this portion is indicative of highly disturbed conditions and thus includes early successional stages such as weedy fields and shrublands. The major exceptions are Wisconsin Point and the outer undeveloped portion of Minnesota Point. These areas include significant stands of white and red pine as well as large areas of beach/dune type vegetation.

Despite the fact the overall impact of the developmental activities on the natural resources was decidedly negative, there were some positive, albeit unintentional, effects also. The Minnesota and Wisconsin Grassy Point areas are two examples of sites where dredge disposal (which created a broad, shallow water area) and the building and subsequent abandonment of docks created two of the most important habitat sites in the lower estuary. The creation of dredge disposal islands also had beneficial side effects in that some of these sites have served as important nesting areas for colonial birds - some of which are now threatened or endangered in Minnesota and Wisconsin.

Nonetheless, the extensive fill operations and the pollution of the river had serious negative impacts on the quality and quantity of available habitats and subsequently on the wildlife of the area. What is left, especially in the lower stretches, is a pale shadow of the former state of the area. It is for this reason that, in the face of the legitimate need for more economic development in the harbor and the need to maintain and enhance the natural resources of the harbor, the remaining habitat must be actively and wisely managed.

SELECTION OF MANAGEMENT SITES

Since this program depends upon the judicious management of discrete parcels within the estuary and not the control and management of the entire area, the selection of the parcels is an important task. Similarly, the criteria used in making the selections are crucial. These general criteria, which follow, address two areas - factors relating directly to the natural resources themselves (e.g., endangered species) and factors relating to human use/appreciation of these resources (e.g., fishing/boating):

1. Importance the parcel plays in support of critical status species.

2. Uniqueness or rarity of habitats on parcel with respect to the harbor, region, states, or nation (critical status habitats).

3. Importance of the parcel to species considered valuable but not of critical status.

4. Importance of the parcel in terms of valuable, although not critical status, habitats present.

5. Importance of the parcel as a recreational area (resource related).

6. Scenic/aesthetic value of the parcel.

Information regarding the resources of the estuary used in assessing the first four of these is contained in the various reports identified in Appendix A. Those elements or factors of importance in the selection of key parcels are summarized in the tables found in Appendix B. The remaining two evaluation categories are more subjective and are discussed on a parcel by parcel basis.

The list of parcels so selected is not intended to be static. Additions or deletions can and should be considered as additional information becomes available and/or changes in the estuary occur. This process will depend upon continued research and monitoring efforts. Candidates for addition or removal ultimately will be subjected to the same evaluation techniques used in selection of present management parcels.

Management Categories

Although the parcels included in the management effort are not categorized, they do fall in several groupings which may help in understanding the intent of the program. They range from those in which strict control and protection of the parcel are recommended to those in which human activity (e.g., recreation) is the prime use. The fifth group, termed non-managed is used to indicate a few areas in the estuary which are especially important from a natural resources perspective but which cannot be considered an active part of the management plan for various reasons.

Natural: These parcels are to be preserved, restored, or enhanced such that "natural", undisturbed conditions predominate. As such, they are to remain relatively free of human impact and stringent restrictions on the type and extent of human use are to be imposed. These parcels include natural features of statewide or regional significance which are intolerant of human disturbance. These areas appear likely candidates for inclusion in the scientific areas programs of the two states. They thus are intended to protect sensitive areas which support endangered or threatened habitats or species and are basically in a natural state.

Conservation - Natural: These parcels are to be preserved, restored, or enhanced such that "natural" conditions predominate. While only human uses compatible with the above emphasis are allowed, the restrictions so required are far less than those pertaining to parcels classified as Natural. These areas include valuable natural features which are

somewhat tolerant of human activities. The prime example of this type of management unit is wetland habitat.

Conservation - Managed: These parcels have resource values worthy of protection and consideration or are especially suited to activities particularly dependent upon the natural features of the parcel and/or estuary as a whole (e.g., fishing, bird-watching). Maintenance of "natural" conditions is not required, although recommended activities are controlled so as to maintain the general character of the area.

Special - Enhancement: Parcels in this category include areas targeted for major enhancement projects directed at specific species and/or habitats.

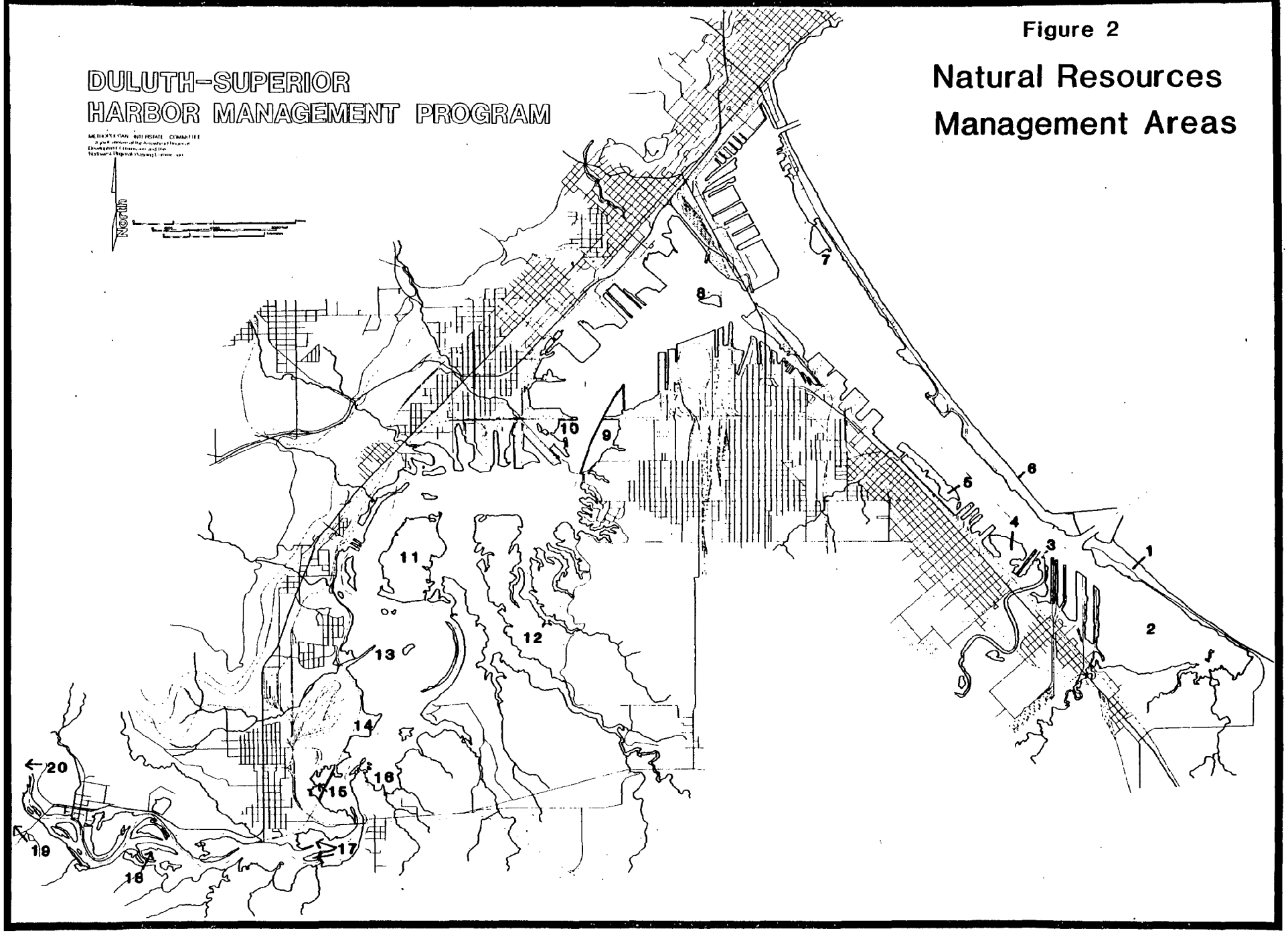
Non-managed: Parcels in this category include areas which are of known importance from a natural resources perspective, but which, due to present activities or other factors, cannot be considered an active part of this management program. They are not part of the St. Louis River estuary composite wildlife management area but are delineated so that those which are likely to incur substantial losses can be examined and appropriate recovery or compensatory plans made.

REVIEW OF MANAGEMENT SITES

The following section provides management guidelines on the 20 sites to be covered by the coordinated management effort. Each parcel is briefly identified with objectives and administrators and physical management recommendations.

Figure 2

Natural Resources Management Areas



PARCEL #1. WISCONSIN POINT.

Ownership: Public (City of Superior and Corps of Engineers).
Approximate Size: 300 acres
Present Zoning and Regulations: Undeveloped; Floodplain.
Land Use Plan Designation: Natural Resources Management.

Overall Objectives

1. **To maintain this parcel in a relatively undisturbed, natural state. In particular to protect the beach-dune and pine forest habitats and associated critical status plant species and to continue the site's importance as a migratory bird route. Use of the area for wildlife observation, hiking, picnicking, and other activities compatible with maintenance of the natural features of the area should continue.**

2. **To provide recreational facilities pertinent to those activities suited to this parcel and maintenance of its natural features.**

Management Recommendations

Administrative:

A comprehensive use plan for this parcel should be developed and implemented. This should be a cooperative effort of the City of Superior and the Wisconsin DNR, with the city being the lead entity. The WDNR would provide technical expertise. Since the WDNR has indicated a strong desire to protect the resources of this parcel, it seems appropriate that it assist in developing such a plan and implementing those portions regarding resource protection. In a similar manner, the City of Superior would take responsibility for implementation of those aspects pertaining to recreational use of the parcel. Designation as a city park should be considered as part of this effort.

Physical Management:

The following recommendations are basic guidelines for development of a management plan for this area. Many of them have been noted in previous documents, in particular in a recent report pertaining to the natural resource values of Wisconsin Point (Koch et al., 1981).

1. **Use of the area by off-road vehicles should be stopped as it has caused serious degradation of the beach-dune plant community.** The City of Superior has taken action in this regard by adopting an ordinance prohibiting this activity and by placing appropriate signs on the point. Enforcement has proven to be a problem. A major effort to prosecute and fine a few offenders would probably prove a major deterrent to other potential abusers. A citizens program encouraging other users to notify authorities of violators is another means of

addressing this problem.

2. **General recreational use of the parcel should be localized by developing low-impact facilities (e.g., picnic tables, pit toilets) at one or two sites.** This would reduce the overall negative impacts and yet maintain the general undeveloped nature of the area. The most likely sites for such facilities are at the end of the point and at the base on the old landfill site. Continuance of present use patterns (scattered throughout the area) will perpetuate the adverse and ever-increasing impacts on this parcel and could eventually cause major changes in its character (e.g. loss of dune vegetation and accompanying erosion problems).

3. **A number of the existing car turnouts should be moved, altered, or in some cases, eliminated so as to reduce the impacts on the sensitive and valuable beach-dune vegetation. Those remaining in use should have clearly marked parking areas and routes to the beach and/or boardwalks to cross over the beach-dune vegetation.** This would greatly reduce the impact on the beach-dune habitat. Closing of turnouts would probably require placement of large boulders or concrete barriers. Material being used to reduce erosion at the old landfill site represents a readily available source of boulders and, if used, would greatly reduce the cost involved in this effort.

4. **In areas of severely disturbed beach-dune vegetation, planting programs should be considered.** Planting programs have proven successful in beach areas throughout the Great Lakes. Minnesota Sea Grant tried such a program on Minnesota Point, and it appears that it was successful. If such a program were attempted, it is strongly recommended that only indigenous seed stock be used.

PARCEL #2. ALLOUEZ BAY.

Ownership: Public (City of Superior).
Approximate Size: 600 acres.
Present Zoning and Regulations: Undeveloped; Floodplain; Navigable waters; Wetlands.
Land Use Plan Designation: Natural Resources Management.

Overall Objective:

To maintain this parcel in its relatively undisturbed, natural state and, in particular, to preserve and protect the extensive wetlands and shallow water habitats and their present use by fish and wildlife.

Management Recommendations

Administrative:

The wetland areas within the bay should be zoned so as to **reflect the need and desire to preserve and protect them.** This action appears to be forthcoming due to recently enacted legislation (Chapter 330) which requires municipalities to adopt protective wetland zoning ordinances.

Physical Management: NO CHANGE.

Although no change in management of the parcel is recommended, several aspects of wildlife usage do warrant monitoring:

1. The black tern population should continue to be censused periodically.

2. The use of the area by mute swans should be monitored. Negative impacts on the wetland areas and waterbird species may occur, and this situation should be evaluated if birds continue to nest in the bay.

3. The status of the double-crested cormorant in the bay should be monitored. If nesting occurs on privately owned land, efforts should be made to inform the owners of the existence and desire to protect the colony. Negotiation of easement rights may be appropriate.

PARCEL #3. MOUTH OF NEMADJI RIVER.

Ownership: Public (Douglas County) and private (Burlington Northern).
Approximate Size: 90 acres.
Present Zoning and Regulations: Wetland; Floodway; Navigable Waters; Wetlands.
Land Use Plan Designation: Natural Resources Management.

Overall Objectives:

1. **To maintain this parcel in a relatively undisturbed and undeveloped state. In particular, to preserve and protect the wetlands and that portion of the Nemadji River lying within the parcel.**

2. **To continue and/or enhance human use of the river compatible with maintenance of its natural features.**

Management Recommendations

Administrative:

Wetland areas within the parcel should remain zoned so as to reflect the need and desire to preserve and protect them.

Physical Management: NO CHANGE.

Recreational boating and fishing should be continued. Although the nearby Barker's Island Marina provides excellent docking facilities for this portion of the harbor, the fishing platform near this parcel serves as a launch site for canoes and other "portable" watercraft and as an access point for local anglers. This facility should be maintained.

PARCEL #4. HOG ISLAND.

Ownership: Public (Douglas County).
Approximate Size: 120 acres.
Present Zoning and Regulations: Heavy Industry and Wetlands; Navigable Water; Wetlands.
Land Use Plan Designation: Natural Resources Management and Recreation.

Overall Objectives:

1. **To protect and preserve the wetland areas and adjoining shallow waters present on the parcel.**

2. **To enhance the recreational value of the island by providing various low-impact facilities.**

Management Recommendations

Administrative:

1. **Wetland areas within the parcel should remain zoned so as to reflect the need and desire to protect and preserve them.**

2. **The island's previous Land Use Plan designation as an area for specific wildlife management (colonial bird nesting site) should be changed to Recreation.**

Physical Management

1. **The island proper should be strongly considered for development as a low-impact recreational area.** Facilities could include picnic tables, grills, pit toilets as well as small docks for boat access. A preliminary design and costing for such facilities has been developed (Bruce et. al., 1982) and seems appropriate to the area.

2. **The outer shore of Hog Island offers potential as a warm water wading beach.** This type of activity would fit well with the general recreational potential of the island. To this end, an examination of the water quality and other parameters pertinent to this use should be conducted.

3. **Since this area is not open to discharge of firearms (City of Superior ordinance), existing duck blinds should be removed.** This would most appropriately be done by local law enforcement officials.

PARCEL #5. BARKER'S ISLAND SANCTUARY.

Ownership: Public (City of Superior).
Approximate Size: 14 acres.
Present Zoning and Regulations: Heavy Industry; Shoreland; Floodway; Designated Bird Sanctuary.
Land Use Plan Designation: Natural Resources Management.

Overall Objective:

To continue efforts, as outlined in the management plan for the sanctuary, to provide nesting habitat for common terns and piping plovers until 1986.

Management Recommendations

Administrative:

The present management agreement between the City of Superior and the WDNR outlines the administrative roles regarding this parcel. Given the failure to date of this site to attract the target bird species, the recommendation is to develop an alternative site (parcel #9) and to remove this parcel as an actively managed area (see recommendations). City of Superior would retain ownership and the management agreement between the City and the WDNR would be terminated.

Physical Management:

No change through 1986. Thereafter, redevelopment of the site as per the recommended general site plan (see recommendations).

PARCEL #6. MINNESOTA POINT (outer undeveloped portion).

Ownership: Public (City of Duluth, City of Superior, and Corps of Engineers).
Approximate Size: 200 acres.
Present Zoning and Regulations: Residential (R-I-C); Floodplain (GFP); Shoreland (GDS).
Land Use Plan Designation: Natural Resources Management.

Overall Objectives:

1. **To maintain this parcel in its relatively natural, undeveloped state and to protect those features which are most important and/or are particularly susceptible to human disturbance. Most importantly, to protect the pine forest and beach-dune habitats and associated critical status plant species and to continue the importance of the site as a migratory bird route.**

2. **To continue present low-impact recreational use of the area which is compatible with protection of its natural features.**

Management Recommendations

Administrative:

1. Although the valuable resources of this parcel do not appear to be in immediate jeopardy, the extreme importance and multiple uses indicates there is a need to devise, adopt, and implement a use plan for the area. **A cooperative effort between the Minnesota DNR and the City of Duluth is recommended. Basic guidelines which should be considered in such a plan are listed in the following section.**

2. The pine forest area should be designated a State Scientific and Natural Area or some other similar classification assuring its continued protection and availability for research and educational activities.

Physical Management:

1. **The beach-dune plant communities should be protected in any way possible.** This implies the continued ban and control of off-road vehicles in the area. Signs placed at the entrance to the area which explain the need to stay out of the dune community areas and their sensitivity to human disturbance would be useful.

2. **The pine forest tracts should be preserved.**

3. **The old Corps of Engineers dock should be examined for potential renovation and subsequent use by small watercraft.** This type of facility is lacking in the harbor. Although the dock needs repair, it is used even now.

PARCEL #7. HEARDING ISLAND.

Ownership: Public (State of Minnesota).
Approximate Size: 32 acres plus adjoining shallow waters (approx. 50 acres)
Present Zoning and Regulations: General Development Shorelands; Floodway (Fp); Designated Wildlife Management Refuge.
Land Use Plan Designation: Natural Resources Management and Enhancement.

Overall Objectives:

To manage this site so as to encourage its use as a colonial bird nesting site and to enhance the value of the surrounding waters to waterbirds and fish.

Management Recommendations

Administrative: NO CHANGE

The site should continue under the management of the MDNR.

Physical Management:

1. **The island proper should continue to be managed as a colonial bird nesting site as per the formal management plan adopted by the MDNR.**

2. **The surrounding waters should be examined for potential enhancement projects to increase their value to waterbirds and fish.**

PARCEL #8. INTERSTATE ISLAND AND ADJACENT WATERS.

Ownership: Public (State of Minnesota) and private (Burlington Northern Railroad and C. Reiss Coal Company).
Approximate Size: 200 acres.
Present Zoning and Regulations: Not Zoned; Floodway; Shoreland.
Land Use Plan Designation: Natural Resources Management and Enhancement.

Overall Objectives:

1. To manage the island as a colonial bird nesting site - particularly for common terns and piping plovers.

2. To explore enhancement schemes for the shallow waters, and to assess the feasibility of using this area as a compensation site with respect to future environmental losses in the estuary.

Management Recommendations

Administrative:

1. Specific plans for enhancement activities in the shallow water area around the island should be drafted. These plans should consider development of wetlands, mudflats, islands, etc.

Physical Management:

1. The island should be managed for colonial birds as per the adopted management plan.

2. Appropriate habitat enhancement activities in the surrounding shallow waters should be implemented.

PARCEL #9. WISCONSIN GRASSY POINT (shallow waters)

Ownership: Public (Douglas County and City of Superior) and private.
Approximate Size: 140 acres.
Present Zoning and Regulations: Heavy Industry; Shoreland.
Land Use Designation: Natural Resources Management.

Overall Objectives:

To maintain the viability of this parcel as an important fish area and to provide new upland habitat for target colonial bird species. (Maintenance of "natural" conditions is not necessary).

Management Recommendations

Administrative:

The value of this property is such that ownership should be in the hands of the WDNR. This transfer should occur as part of the physical improvements described below.

Physical Management:

It is recommended that an island be created in the eastern portion of this parcel for colonial bird nesting habitat (see detailed management plan). The remainder of the parcel should be passively managed. The fishery value of the site indicates a need to conduct monitoring programs to help determine the need for any active fish management efforts.

PARCEL #10. MINNESOTA GRASSY POINT (and adjacent islands).

Ownership: Public (tax forfeit) and private.
Approximate Size: 100 acres.
Present Zoning and Regulations: Waterfront (W-1); Shoreland; Floodplain (GFP); Wetland.
Land Use Plan Designation: Natural Resources Management.

Overall Objective:

To maintain the undisturbed portions of the parcel in their relatively natural state, and to return the remaining disturbed areas to a "natural" state. In particular, to perpetuate the unique wetlands and shallow waters and their use by waterbirds and fish.

Management Recommendations

Administrative:

1. **Those portions of the parcel in public ownership (tax forfeit) should be put under the jurisdiction of the MDNR for the purposes of managing them as a wildlife management area.**

2. **Private ownership within the parcel should be determined, and the feasibility and desirability of transferring ownership to the State of Minnesota or other public entity examined.**

3. **Assuming the foregoing actions occur, a management plan for the area should be developed.**

Physical Management:

The following represent suggested actions which could be incorporated in the management plan for the parcel:

1. Those areas with debris present should be cleaned up.

2. The present flow patterns of Keene Creek should be examined and re-routing considered.

3. Present roadways should be closed.

4. Construction of boardwalks and other public use developments of the area compatible with protection of the parcel should be explored.

5. Possible expansion of the available common tern nesting habitat should be examined and implemented if deemed feasible.

PARCEL #11. CLOUGH (Whiteside) ISLAND.

Ownership: Private.
Approximate Size: 370 acres plus adjoining waters.
Present Zoning and Regulations: Forestry; Shoreland; Wetlands.
Land Use Plan Designation: Natural Resources Management and Recreation.

Overall Objectives:

1. **To maintain the marshes and waters adjoining the island in a relatively undisturbed, natural state and to continue their use by waterbirds and fish.**

2. **To develop the island proper as a low-level recreational site.**

Management Recommendations

Administrative:

1. **The island should be designated a park by the cities of Superior and Duluth to be managed jointly.** This requires appropriate agreements be negotiated with the present owners, the Whiteside Estate. Superior should be designated the lead agent, but specific management responsibilities would be delegated to each city.

2. **Since the island would be used by both Wisconsin and Minnesota residents, the possibility of changing fishing regulations so that Minnesota residents could fish from the island with a Minnesota license should be considered.**

Physical Management:

The island should be managed as per the management plan drafted by the MIC. Details are given in that document and include a trail system, primitive camp sites, and a day use area near the old homestead buildings.

PARCEL #12. SUPERIOR MUNICIPAL FOREST (portion of) and POKEGAMA BAY.

Ownership: Public (City of Superior).
Present Zoning and Regulations: Forestry; Shoreland; Navigable Waters; Wetlands.
Approximate Size: 4,500 acres.
Land Use Plan Designation: Natural Resources Management and Recreation.

Overall Objectives:

Municipal Forest - As per the Master Plan (with additions below). The most important natural resource issue is the development and implementation of a cooperative plan between the City of Superior and the WDNR to include all or a portion of the prime boreal forest habitat in the WDNR Scientific Areas Program.

To provide diverse recreational opportunities. The forest plan as it presently exists appears to be in general accord with the Forest's inclusion as a key resource parcel of the estuary.

Bays and Marshes - To maintain the waters and wetlands in their relatively undisturbed, natural state and to continue their use by fish and waterbirds and as low-impact recreational sites.

Management Recommendations:

Administrative: NO CHANGE.

The forest should continue under the management of the City of Superior. A specific management strategy for the native boreal forest tract should be designed in cooperation with the WDNR. The latter area should be made part of the WDNR Scientific and Natural Areas program.

Physical Management:

As per the Management Plan.

PARCEL #13. MORGAN PARK MUDFLATS AND SPIRIT ISLAND AREA.

Ownership: Public (City of Duluth and Corps of Engineers).
Approximate Size: 260 acres.
Zoning and Regulations: Manufacturing (M-2); Shoreland; Floodplain (GFP); Wetlands.
Land Use Plan Designation: Natural Resources Management.

Overall Objective:

To preserve the wetlands, shallow waters, mudflats, and colonial bird nesting sites present on the parcel.

Management Recommendations

Administrative: NO CHANGE.

Present ownership and management by the City of Duluth and the inclusion of this parcel as part of the Western Waterfront Trail are appropriate.

Physical Management:

That portion of the parcel owned by the City of Duluth should be managed in accordance with the recommendations made in the biological study of the Western Waterfront Trail (Niemi et al., 1978). Pertinent statements from this document include:

1. The pollution status of effluents entering the river in this area should be determined.

2. Human use of the mudflats and point should be kept minimal.

PARCEL #14. SPIRIT LAKE POINT (and adjoining wetlands).

Ownership: Public (City of Duluth).
Approximate Size: 50 acres.
Present Zoning and Regulations: Industrial (M-2); Shoreland; Floodplain (GFP); Wetlands.
Land Use Plan Designation: Natural Resources Management.

Overall Objective:

To maintain this parcel in its relatively undisturbed, natural state. Limited human use compatible with preservation of the natural features should be allowed. In particular, to preserve the wetlands and the relatively unique maple-basswood forest.

Management Recommendations:

Administrative: NO CHANGE.

Present ownership by the City of Duluth and the inclusion of this parcel as part of the Western Waterfront Trail project are appropriate.

Physical Management:

1. **This parcel should be managed according to the general guidelines given in the study of the natural resources of the Waterfront Trail.**

2. **Overall use of the area should be controlled so as to limit adverse impacts on the vegetation.** Ad hoc trails on the point should be improved to the extent necessary to encourage their use rather than permit indiscriminant wandering.

3. **Some of the brush at the end of the point could be removed to provide a better view of the river and sites for picnic, etc..**

PARCEL #15. MUD LAKE (and adjacent wetlands).

Ownership: Public (City of Duluth).
Approximate Size: 230 acres.
Present Zoning and Regulations: Commercial (M-2); Shoreland; Floodplain (GFP); Wetland.
Land Use Plan Designation: Natural Resources Management.

Overall Objectives:

1. **To maintain this parcel in its relatively undisturbed, natural state and in particular to preserve and protect the wetlands and shallow waters and their use by fish wildlife.**

2. **To improve the usability of this site for low-level compatible recreational purposes.**

Management Recommendations:

Administrative: NO CHANGE.

Present ownership by the City of Duluth and inclusion of the parcel in the Western Waterfront Trail system are appropriate.

Physical Management:

1. **This parcel should be managed in accord with the guidelines given in the natural resources study of the Waterfront Trail System (Niemi et al., 1978).**

2. **The status of the Canada goose on this parcel should be determined.**

3. **Water quality in this area should be monitored for chemical contamination and steps taken to remedy any problems which may exist.** The known presence of chemical contaminants in ponds and the ground of the immediately adjoining retired U.S. Steel plant is of concern. It is possible that some of the toxic chemicals are finding their way into the river system, and this should be carefully examined by appropriate state and federal agencies. Clean-up of the old plant site has not occurred on schedule and should be facilitated.

PARCEL # 16. SOUTH SPIRIT LAKE MARSH.

Ownership: Public (Douglas County and Village of Oliver).
Approximate Size: 240 acres (70 wetland and 170 shallow water).
Present Zoning: Special Use; Wetland; Shoreland; Floodway.
Land Use Plan Designation: Natural Resources Management.

Overall Objective:

To maintain this parcel in its relatively undisturbed, natural state. In particular, to preserve and protect the wetlands and shallow waters and their use by fish and wildlife. Continued use of the parcel for trapping, hunting, and other activities compatible with maintenance of its natural character should be allowed, but activities and/or developments which could adversely affect the more important and sensitive features should not.

Management Recommendations

Administrative: NO CHANGE.

All but a small segment of the marsh is owned by Douglas County, and present zoning is appropriate protection for the site. The shallow waters are controlled adequately via permit controls by the WDNR.

Physical Management: NO CHANGE.

PARCEL # 17. OLIVER BRIDGE MARSH/BEAR ISLAND.

Ownership: Public (City of Duluth) and private.
Approximate Size: 120 acres.
Present Zoning and Regulations: Residential (R-I-C), Shoreland, Floodplain (FW), Wetlands.
Land Use Plan Designation: Natural Resources Management.

Overall Objective:

To maintain this parcel in its relatively undisturbed, natural state and, in particular, to preserve and protect the wetlands and shallow waters and their use by fish and wildlife. Present recreational uses (e.g., fishing, birdwatching) should continue.

Management Recommendations:

Administrative: NO CHANGE.

1. Present zoning and permitting controls seem adequate to protect this area./

2. If desired, private organizations (e.g., The Nature Conservancy) could be contacted regarding acquiring fee or easement title to the shoreline and dedicating it to natural resources management.

Physical Management: NO CHANGE.

PARCEL #18. SOUTH HORSESHOE ISLAND AREA.

Ownership: Private (Werco Wisconsin), State of Wisconsin*
Approximate Size: 200 acres.
Present Zoning and Regulations: Forestry, Shoreland; Floodway; Wetlands.
Land Use Designation: Natural Resources Management.

Overall Objective:

To maintain this parcel in its undeveloped, natural state. In particular, to protect the wetlands and shallow waters and their use by to fish and wildlife. Use of the area for waterfowl hunting and sportfishing and other non-destructive activities should be continued.

Management Recommendations:

Administrative:

The possibility of acquiring the island portions of this parcel or negotiating a cooperative agreement should be examined by the WDNR.

Physical Management: NO CHANGE.

*NOTE: State of Wisconsin owns Nekuk and Arnik Islands and a nearby islet. These islands will be managed in a natural and undisturbed nature under Wisconsin Islands program. Limited and compatible uses such as picnicking, biking, wildlife observation, and, in some cases, camping, will be permitted.

PARCEL #19. SWAMP LAKE (Olson's Pond).

Ownership: Public (State of Minnesota) and private.
Approximate Size: 10 acres.
Present Zoning and Regulations: Commercial; Floodway; Shoreland; State Park.
Land Use Plan Designation: Natural Resources Management.

Overall Objective:

To maintain this pond in its natural state and in particular to perpetuate the green heron colony.

Management Recommendations

Administrative:

The only administrative actions which appear warranted relate to ongoing excavation of the adjoining hillside. This has resulted in sloughing and destruction of wetland habitat.

Physical Management:

The status of the green herons and river otter on this parcel should be determined.

PARCEL #20. FOND DU LAC SPAWNING GROUNDS.

Ownership: Public (State of Minnesota) and private.
Approximate Size: 1-2/3 miles of river.
Present Zoning and Regulations: MN - Suburban, Floodplain (GFP), Shoreland.
WI - Floodplain, Shoreland.
Land Use Plan Designation: Natural Resources Management.

Overall Objective:

To protect and maintain the value of this area as a walleye spawning ground.

Management Recommendations

Administrative: NO CHANGE.

Present permitting and zoning controls of the area as well as restrictions placed on the sportfishing season seem adequate.

Physical Management: NO CHANGE.

The MDNR and WDNR should continue to control activities in this area to insure its viability as a spawning ground. Shoreline development which could adversely affect this use should not be allowed.

SPECIFIC MANAGEMENT PLANS

Only a handful of the twenty resource sites requires a specific plan to guide active management activities. Those identified as needing plans are:

Barkers Island
Hearding Island
Interstate Island
Wisconsin Grassy Point
Minnesota Grassy Point

Plans have already been prepared and implemented for Barkers and Hearding Islands. A plan for Interstate Island has been drafted and partially implemented. In addition, two non-resource areas - Erie Pier disposal site and the Duluth port terminal - have been the scenes of planned activities to discourage their usage by birds; the intent being to keep them off the sites and encouraged to use the designated wildlife areas.

REVIEW OF EXISTING PLANS

The following provides a brief description of the management plans for three existing sites. A summary of successes to date is also included.

Barkers Island

Created when the Barkers Island marina and hotel complex opened in 1980, this bird sanctuary is the first designated management area in the harbor (technically, the first managed site was at Duluth's port terminal to protect nesting birds, but this was a temporary measure).

The sanctuary occupies 14 acres of land in the southeastern end of the island. It is intended to provide protected nesting area for piping plovers and common terns. The objectives of the area as defined by the WDNR are:

1. The formal designation of a suitable area for Piping Plovers and Common Terns to nest and rear young.
2. To preserve existing suitable habitat and to develop and maintain other suitable habitat for Piping Plovers and Common Terns for nesting and brood rearing.
3. To monitor and evaluate management activities and to make recommendations for future management activities.
4. To maintain a viable breeding population.

The City of Superior owns the site and is responsible for maintaining it. Management has included sloping the site, controlling vegetation, and, beginning in 1982, using decoys to attract birds. In 1983 an automatic tape system was used to broadcast nonaggressive tern calls.

Use of the site by the targeted bird species has been limited. No nesting has occurred and no responses to the attractive techniques have been observed. There are no clear cut known reasons for the lack of success on the site.[1]

Hearding Island

Hearding Island was officially designated a Wildlife Management Area in 1982. In the spring of 1983 the site plan was implemented by clearing 11 acres of land. The management goals for the island are similar to that for Barkers.

In 1983, 1984, and 1985, both decoys and tape broadcasts were used to attract birds. Almost immediately after the systems were in place in 1983, a pair of terns attempted to nest on the island. There were no repeat attempts in 1984 although terns were observed on the island. No plovers were seen in 1984 although there were reports of feeding activity in 1983. Lack of success in 1984 (and early 1985 as well) may be due to several factors including: the presence of a great horned owl, disturbances by children and dogs, and the nearness of trees at the edge of the site.

Hearding Island is both owned and managed by the Minnesota DNR.

Interstate Island

The third actively managed site is Interstate Island. This site is a joint venture between the two DNRs as the island straddles the state line.

Again, this area has virtually identical objectives as the prior two sites. In addition, though, Interstate Island has a second purpose:

- to enhance the habitat and overall biological value of Interstate Island in partial compensation for historic environmental losses in St. Louis Bay due to development activities.

Interstate offers an almost ideal setting for colonial bird management. It is isolated, of the appropriate optimal size (8 acres), close to traditional nesting areas, and it has both good bird shorelines as well as deep water access for landing heavy machinery for shaping the site.

In late 1984 the area was cleared and prepared according to the management plan. This work occurred far too late for any bird activity. However, in 1985 the site has an estimated 50 nesting pairs of common terns.

---

[1]Fred Strand, WDNR Brule Area Wildlife Manager, personal correspondence, April 29, 1985.

Review of Situation

As of 1985, a review of the efforts to manage the St. Louis River estuary for colonial bird species (the primary focus of natural resources management efforts in addition to the fishery) would be as follows:

1. There is not yet an adequate amount of quality habitat for piping plovers and common terns.

2. Active discouragement efforts will keep terns and perhaps plovers off such traditional sites as the Duluth Port Terminal and Erie Pier.

3. The eventual loss of habitat at the Duluth Port Terminal will force that immense ring-billed gull colony to relocate. This will put an extreme amount of pressure on the available nesting sites as there are many more gulls than terns; the gulls arrive earlier in the season, and they are more successful in maintaining their nesting space over the terns.

4. There is reason to believe that some terns may have shifted to breeding sites elsewhere on Lake Superior. The breeding population at Ashland, Wisconsin, has increased in recent years. This increase may be a result of some birds moving from Duluth to Ashland, but there is no evidence to support this contention.

5. Of the managed sites only Interstate can be rated a success, while Hearding is still unclear and Barkers has not yet been successful. The reasons for these differences include:

   - **Interstate** - virtually an ideal site in terms of size, location, and low degree of disturbance;

   - **Hearding** - a traditional nesting site that is ideally located within the harbor although it may be too big, have too much vegetation, and be subject to too much disturbance;

   - **Barkers** - no one reason can be determined for its lack of success, but the probable reasons are too much disturbance and activity (the level may not be enough to force an existing colony to relocate but is enough to prevent one from starting), and an indadequate amount of highly preferred habitat.

The varying levels of success between the three managed sites takes on increased understanding in light of activities in 1985. The MDNR employed active efforts to discourage common terns from nesting at Duluth's port terminal. As a result, the birds initially relocated at Erie Pier where they were forced to move again. They went back to the port terminal. A second effort there finally uprooted them. Many, maybe one-third to half, went to Interstate Island; some went to sites near the Skyharbor Airport on Minnesota Point; the rest were unaccounted for.

The key observation is that even under this directed pressure to relocate, the terns did not move to Hearding or Barkers Islands. While no one can claim to know why birds choose one nesting site over another, even though they appear

to be similar, it is clear that Interstate Island has preferred over the others.

NEW MANAGEMENT PLANS

The natural resources management work done to date has made tremendous strides in righting the imbalance between development and the environment in the lower harbor. Nonetheless, as this review indicates there is a need to make adjustments and to undertake plans at other sites. This report highlights four such efforts:

1. Minnesota Grassy Point (new)
2. Interstate Island (phase II)
3. Barkers Island (revise)
4. Wisconsin Grassy Point (new)

Because this report is focusing on upland habitat for colonial bird species and is centered on the Wisconsin side of the harbor, the Minnesota Grassy Point project will be given only passing attention. In general, this site is a multi-purpose management area that takes advantage of its unique mix of wetlands. There are several small islands that do serve as bird nesting sites; they should be given special attention as they could easily be improved to provide more and better such habitat.

Interstate Island

As has already been noted, this island has shown early signs of being a highly successful project. The phase I activities, which consisted of improving the island itself, have been completed and now only need monitoring and maintenance.

However, the initial management plan stated the need for future phases of development and management. In particular, there is a desire to create additional habitat by building several more small islands in the shallow water near the main island. These islands would provide new upland habitat for terns and plovers as well as other important non-game and game species. Moreover, the work would be undertaken so as to increase the diversity of fish habitat. Finally, the design and location of the islands would be such so that protected shallow water areas would be provided to foster growth of submerged and emergent aquatic vegetation. Mudflats as feeding areas are additional possibilities.

Undertaking the design of the phase II work will require extensive coordination between the two DNRs and other groups. The range of this work is beyond the scope of this project. In addition, the legal issues of island creation on the Wisconsin side must be resolved. Unlike the Wisconsin Grassy Point project, which will be described later, existing Wisconsin law cannot be utilized to permit the types of activities needed for phase II work.

However, the success of the initial Interstate Island project, the continued need for more quality habitat in the lower harbor, and the ideal location offered by this site, mandates that the two DNRs and other interested parties pursue this work as a priority activity.

Barkers Island

The fact of Barkers Island is that, despite management efforts, the site has failed to attract birds even when efforts have been made to forcibly relocate them from existing nesting grounds. Thus, this report recommends that management at the site makes a drastic change coupled with the creation of the new Wisconsin Grassy Point area.

Under this proposal several key elements are highlighted:

1. Barkers would be de-designated as a bird sanctuary.

2. The interior portion of the site would be made available for development.

3. The bulk of the shoreline would be protected and retained for use by shorebirds for feeding and other activities.

4. The area of the site containing the grass of Parnassus (Parnassia polustris), which was expressly protected by the Barkers plan, would remain as a protected area. In fact, this site would be the core of a retained "natural" area for songbirds, shorebirds, and the like.

Implementation of this change would be coordinated and timed with the development of the Wisconsin Grassy Point site. One is not to occur without the other; binding legal agreements will be necessary to effect this transfer. The early acceptance of this plan by the appropriate parties - City of Superior and WDNR - would permit the initiation of plans to set into motion the steps necessary to accomplish the coordinated plans.

Wisconsin Grassy Point

The following outlines the proposed draft management scheme for this site. Appendix E contains the full draft plan.

This area is a large (roughly 140 acres) expanse of shallow water and varied wetlands and shoreline. The shallow water area is valuable habitat for the estuary's fishery; the shoreline is used by a wide variety of birds. There are no nesting areas for terns or plovers.

The goals of the management area would be identical to those of Interstate Island although the implementation programs vary. The goals are:

1. To enhance and expand the natural resource base of St. Louis Bay.

2. To enhance the habitat and overall biological value of the management area in partial compensation for historic environmental losses in St. Louis Bay due to developmental activities.

As with the other areas, this project will be managed as an integral element of the total estuary plan. In particular, it will replace the Barkers Island site and directly complement the Interstate Island project.

Although it is a diversified site with values to many different species, the primary focus of active management will be on providing nesting habitat for common terns and piping plovers. Secondary attention will be given to creating additional quality habitat for various fish species.

Only passive management will be required to maintain the existing fish habitat and shoreline areas.

Specific actions include:

1. Designating entire area as a wildlife management site.
2. Acquiring the site or obtaining legal control of it.
3. Creating a 1-3 acre island designed and located so as to maximize its value to the target species.
4. Maintaining existing shallow water and shoreline areas.
5. Monitoring and evaluating management activities.

The island will be located roughly where shown on the map in Appendix E. Any shape is acceptable, but attention will have to be given to any design features that could enhance fish habitat.

As a new island, there will be no vegetation at first. The site will be allowed to naturally vegetate (unless plantings are desired) to a bare to sparse cover, less than a meter high, and evenly distributed where it occurs.

Implementing this program is fairly straight forward, but the matter of timing with the Barkers Island site is critical. Steps taken to implement Wisconsin Grassy Point must be underway at the time agreement to terminate the Barkers Island site is signed.

The remaining noteworthy action is the timing to obtain material to create the island. Every step should be taken to obtain free or low-cost material. Obtaining it may necessitate carefully orchestrated actions.

RECOMMENDATIONS

The recommendations of this report focus on certain aspects of the overall natural resources management needs of the Superior-Duluth harbor. They address critical resources and attempt to direct efforts towards achievable and necessary tasks.

1. The Wisconsin and Minnesota DNRs should approve the coordinated designation and management program for the harbor's natural resources. This consists of the twenty identified sites and the management perspective that the harbor is a single-resource unit that can and must be managed as a single entity through the management of distinct and separate parcels.

   Minnesota can effect this in part through its port plan process. Wisconsin must either adopt it via administrative or board decision or set into place a process by which it is to be done.

2. The two DNRs should agree to and finalize a phase II plan for Interstate Island which includes the creation of additional upland and aquatic habitat.

3. The DNRs should continue to monitor the current management work on Hearding and Interstate Islands.

4. The Minnesota DNR should initiate a process to develop and implement a management plan for the Minnesota Grassy Point site.

5. The Barkers Island bird sanctuary should be de-designated by executing an agreement as noted in item 7. This process will require holding a public hearing, and the Public Hearing Examiner will have to uphold the proposed action if it is to occur.

6. The Wisconsin Grassy Point Wildlife Management Area should be established. The steps to be taken include:

   - designation of the site by the WDNR;
   - ownership obtained by either WDNR or City (with control by WDNR);
   - adoption of a final plan including assignment responsibilities; this covers the technical design of the island;
   - implementation according to a set schedule.

7. The City of Superior and the WDNR should execute an agreement covering the terms and process by which the Barkers Island site is de-designated and the Wisconsin Grassy Point is designated. This agreement should include:

   - precise statements describing actions and responsibilities to be taken at each site;
   - binding assurances that the actions will occur; and
   - a time table for implementation and the setting of it in motion.

   This agreement should be executed at the earliest possible date so that implementation activities can be initiated.

Appendix A

Select References Pertaining to the Natural Resources of the St. Louis River Estuary

Amenity One, Inc. 1979. Master development plan, Municipal Forest, City of Superior, Wisconsin. Report to City of Superior, Dept. of Planning and Development. 46 pp.

Arbib, R. 1981. The Blue List for 1982. American Birds 35.

Architectural Resources, Inc. 1973. Duluth-Superior harbor study, Phase I - inventory. Report to U.S. Army Corps of Engineers, St. Paul District.

Barger, N.R. 1951. Wisconsin Mammals. Wis. Dept. of Cons. Publ. No. 351. 54 pp.

Bernard, R.F. 1967. The birds of Douglas County, Wisconsin. Passenger Pigeon 29:3-36.

Breckenridge, W.J. 1944. Reptiles and Amphibians of Minnesota. Univ. of Minn. Press, Minneapolis. 202 pp.

Bruce, R.J. et al. 1982. NP ore dock/Hog Island use analysis. Report to Metropolitan Interstate Committee, Duluth, MN. 64 pp.

Burt, W.H. 1957. Mammals of the Great Lakes Region. Univ. of Mich. Press, Ann Arbor. 246 pp.

Curtis. J.T. 1959. The Vegetation of Wisconsin / An Ordination of Plant Communities. Univ. of Wis. Press, Madison. 657 pp.

Davidson, D.W., and J.M. Bernard. 1969. Mature pine forests in Duluth harbor area. Jour. Minn. Academy Science 35:118-121.

Davis, T.E., G.J. Niemi, J. Kotar, and P.B. Hofslund. 1978. Assessment of habitat types and bird populations of the lower St. Louis River estuary - Phase II. Report to Metropolitan Interstate Committee, Duluth, MN. 95 pp. and appendices.

Davis, T.E. and G.J. Niemi. 1979. Larid breeding populations at the western tip of Lake Superior. Loon 52(1):3-14.

Davis, T.E. and R.M. Erwin. 1982. Potential impacts of extended winter navigation upon migratory birds of the Upper Great Lakes. U.S. Fish and Wildlife Service, OBS. In review.

DeVore, P.W. 1978. Fishery resources of the Superior-Duluth estuary. Report to the Metropolitan Interstate Committee, Duluth, MN. 80 pp.

Eckert, K.R. 1974. A Birder's Guide to Minnesota. Curle Printing Co., Inc., Minneapolis, MN. 114 pp.

Great Lakes Basin Commission. 1975. Great Lakes basin framework study.

Green, J.C., M.A. Jirsa, C.M. Moss. 1977. Environmental geology of the North Shore. Minnesota Geological Society and Coastal Zone Management Program, Minnesota. 99 pp.

Green, J.C. and R.B. Janssen. 1975. Minnesota Birds: Where, When and How Many. Univ. of Minn. Press, Minneapolis. 217 pp.

Gunderson, H. and J.R. Beer. 1953. The Mammals of Minnesota. Univ. of Minn. Press, Minneapolis. 196 pp.

Hazard, E.B. 1982. The Mammals of Minnesota. Univ. of Minn. Press, Minneapolis. 312 pp.

Hofslund, P.B. 1958. Bird migration in the Duluth area. Flicker 30:53-57.

Johnson, E.M. 1963. A taxonomic study of the flora of Minnesota Point. Master of Arts Thesis, Duluth. 36 pp.

Koch, R.G. 1981. Vegetation and floristics of Allouez Bay, Superior, Wisconsin. Preliminary report, Wisconsin Coastal Management Program. 35 pp.

Koch, R.G. et al. 1980. Wisconsin Point - A review of the fauna and flora with management suggestions. Report to the City of Superior, Superior, WI. 19 pp. and appendices.

Lakela, O. 1965. A Flora of Northeastern Minnesota. Univ. of Minn. Press, Minneapolis. 541 pp.

Lounsbury, S., T.E. Davis, and G.J. Niemi. 1981. An assessment of impact of Arrowhead Bridge construction on a ring-billed gull colony. Report to State of Wisconsin, Dept. of Trans. 26 pp.

Martin, L. 1965. The Physical Geology of Wisconsin. Ed. 3. Univ. of Wis. Press, Madison. 608 pp.

Mangel, J.T., Jr. 1971. Geology of the Twin Ports area, Superior-Duluth. 35th Annual Tri-State Field Conference Guidebook.

Metropolitan Interstate Committee. 1977. Inventory of the resources of the Duluth-Superior Harbor: identifying the issues. 123 pp.

Metropolitan Interstate Committee. 1978. Land use and management plan for the Duluth-Superior harbor. 82 pp. and appendices.

Metropolitan Interstate Committee. 1981. Recommendations for the disposal of maintenance dredged material in the Duluth-Superior harbor.

Morrisson, K.D., W.J. Breckenridge, and J.D. Herz. 1955. Where to find birds in Minnesota. Itasca Press: The Webb Publishing Company, St. Paul, MN.

National Biocentric, Inc. 1975. Environmental impact assessment for Duluth-Superior harbor. Report to U.S. Army Corps of Engineers, St. Paul District. 266 pp. and appendices.

Niemi, G.J., T.E. Davis, J. Kotar, and P.B. Hofslund. 1977. Assessment of habitat types and bird populations in the Duluth-Superior harbor. Report to Metropolitan Interstate Committee, Duluth, MN. 75 pp. and appendices.

Niemi. G.J., T.E. Davis, H. Collins, P.B. Hofslund, J. Kotar, and P. Monson. 1978. Flora and fauna of the Western Waterfront Trail. Report to the City of Duluth, Dept. of Planning and Development. 125 pp. and appendices.

Niemi, G.J. and T.E. Davis. 1979. Notes on the nesting ecology of the piping plover. Loon 51:74-79.

Niemi, G.J., T.E. Davis, and P.B. Hofslund. 1979. Distribution and relationships of habitats and birds in the St. Louis River estuary. Report to U.S. Fish and Wildlife Service, St. Paul Field Office, St. Paul, MN. 59 pp. and appendices.

Roberts, T.S. 1932. The Birds of Minnesota. Univ. of Minn. Press, Minneapolis.

Schram, S. 1982. Characteristics of a northern pike population in a Lake Superior estuary. (in prep.).

Schwartz, G.M. 1949. The geology of the Duluth metropolitan area: Minnesota Geological Survey Bulletin 33. 136 pp.

Sydor, Michael and Kirby Stortz. 1980. Sources and transports of coal in the Duluth-Superior Harbor. U.S. Environmental Protection Agency, Duluth, MN. 84 pp.

Tans, W. 1979. Scientific and Natural Area Report, Dwight's Point - Kimball's Bay area. Wis. Dept. of Nat. Res. files.

Tans, W. and R. Dawson. 1980. Natural area inventory, Wisconsin Great Lakes Coast. Wis. Dept. of Nat. Res., Scientific Areas Section, and Office of Coastal Management, Wis. Dept. of Admin. 53 pp.

U.S. Army Corps of Engineers. 1971. Great Lakes region inventory report, national shoreline study. 220 pp.

U.S. Army Corps of Engineers. 1974. Detailed project report, beach erosion control on Minnesota Point at Duluth, Minnesota. U.S. Army Corps of Engineers, St. Paul District. 30 pp.

U.S. Army Corps of Engineers. 1975. Draft Environmental Impact Statement, Duluth storm water flood control project. U.S. Army Corps of Engineers, St. Paul District. 80 pp. plus appendices.

U.S. Army Corps of Engineers. 1976. Duluth-Superior and adjoining area urban study. Appendix - Urban Area 1.

U.S. Dept. of Commerce. 1965. Decennial census of U.S. climate. Climatic summary of the U.S.: Wisconsin. Washington, D.C.

U.S. Environmental Protection Agency. 1977. Report on the degree of pollutionof bottom sediments, St. Louis River, Minnesota.

Weston, R.T., Inc. 1974. Enviornmental impact report, taconite transshipment facility, Superior, WI. Rep. to Burlington Northern, Inc.

Wis. Dept. of Nat. Res. 1978. Lake Superior drainage report. 87 pp. and Appendices.

Wis. Dept. of Nat. Res. 1978. Wisconsin clean air act amendment program, Volume I Non-attainment areas, Chapter 2. Bureau of Air Management. 160 pp.

Wis. Dept. of Nat. Res. 1981. St. Louis River northern pike report. Northwest District Headquarters, Spooner WI.

Wis. Dept. of Nat. Res. 1982. 1981 Superior Harbor Index Station Report.

Wis. Dept. of Nat. Res. 1982. Endangered and threatened species list. Pub. 1-1520 (82).

Appendix B

RESOURCE SUMMARY TABLES

The following tables highlight the resources and resource areas which are most valuable in the St. Louis River estuary. The tables are:

B1. Important habitats/plants communities

B2. Sites rated as valuable natural areas by the WDNR scientific areas program

B3. Special status plant species

B4. Special status and other valuable bird species

B5. Special status and other valuable reptiles, amphibians, mammals and fish

Table B1. Important Habitats/Plant Communities of the St. Louis River Estuary.

**1. Wetlands (water quality, flood control, historic losses large)
**2. Lake Dunes and Beaches (rare and sensitive plant communities)
**3. Boreal Forest (representative of original forest type, rare)
4. Maple-Basswood Forest (climax hardwood forest, rare in estuary)
5. Major fish spawning areas
6. Major fish feeding areas
7. Major fish nursery areas
8. Colonial bird nesting areas
9. Major bird migration areas
10. Major bird feeding areas

** Critical Status Habitat

Table B2. Sites within the St. Louis River Estuary Rated as Valuable Natural Areas by the Wisconsin DNR Scientific Areas Program.[1]

Area Name (County)	Code	Ownership	Description and Comments
Allouez Bay (DOUGLAS)	NA-1	City of Superior	A shallow bay between the Superior harbor and Wisconsin Point, featuring an emergent aquatic community of Sparganium, Sagittaria and Zizania and numerous submerged and floating leaved aquatics. There is good interspersion of aquatics and open water, and numerous mud flats provide excellent waterfowl and shorebird habitat. The bay is subject to the disturbances of Great Lakes shipping vessels, industrial pollution, sewage, and air pollution from the nearby ore shipping facility but still it contains natural features.
Wisconsin Point (DOUGLAS)	NA-1	City of Superior	A long, narrow sand spit into Lake Superior, in Wisconsin about 2-1/2 miles long. Pine forest and open beach and dune communities are best developed. Area heavily used for picnicking and hiking and is subject to some noncompatible uses. See Allouez Bay. Critical plant species present.
Dwight's Point-Kimballs Bay Area (DOUGLAS)	NA-1	City of Superior	A two mile peninsula jutting into St. Louis River contains old-growth groves of red and white pine among more second growth deciduous-conifer mixed woodland. Such long serpentine inland bays, such as Kimballs and Pokegama Bay, are unique in Wisconsin to this naturally flooded river mouth. Wetland lines much of the bays which is used extensively by waterfowl. This area contains some of the best boreal forest remaining.

Table B2. (concluded)

Area Name (County)	Code	Ownership	Description and Comments
St. Louis River Marsh (DOUGLAS)	NA-2	Private	Submerged and emergent plant communities along the St. Louis River, with some mud flats and shorebird habitat. Area from Red River mouth to Pokegama River mouth. Open marsh along shore and on small islands not too diverse and characteristic of large riverine systems. Dominant plants are Sagittaria, and some wild rice observed. Three species of yellow water lily present. Common tern colonies have been observed on island.
Nemadji River (DOUGLAS)	NA-2	City of Superior, Private	The river valley and extensively meandering river zone from below its confluence with the Black River to its mouth in Superior Harbor. It is a sluggish river whose channel is deeply entrenched into red clay. The river fluctuates wildly and carries a heavy silt load. Adjacent swamp timber some 15' above the river is deciduous forest of black ash, white ash, basswood, box elder, balsam poplar, silver maple and Am. elm, with scattered white cedar white spruce, all of small size. Main value is erosion control and ecological corridor value.
Pokegama River Wetlands (DOUGLAS)	NA-2	City of Superior	A zone of emergent aquatics up to 350' wide along each side of the Pokegama River near its drowned mouth. Cattails and bur reed dominate, and some wild rice is present. Current is slow and many floating leaved aquatics occur. Sedge marsh occurs closer to the birch-aspen uplands.

[1] Taken from WDNR and OCM, 1980.

[2] NA-1. Natural Areas - tracts of land and/or water so little modified by man's activity, or sufficiently recovered, that they contain nearly intact native plant and animal communities believed to be representative of the presettlement landscape. They are of statewide or greater natural area significance. Some tracts containing critical species habitats are also within this designation.

NA-2. Natural Areas - tracts of land and/or water slightly modified by man's activities or insufficiently recovered from past disturbances such that they are of county or multi-county natural area significance because of one or more of the following reasons: the degree of quality is less that the ecologically defined ideal, and there is evidence of past or present disturbance from logging, grazing, water level manipulation, or pollution, etc.; the type may be the most abundant or a very common type in the region, only the very best of which might qualify for state scientific area recognition, or the area may be too small

Table B3. Special Status Plant Species of the St. Louis River Estuary.

		STATUS[1]			
		FED	WIS	MN	EST[2]
**1.	Ranunculus cymbalaria	--	E	--	R
**2.	Parnassia palustris	--	T	--	R
**3.	Ammophila brevigulata	--	-	T	R
4.	Bidens discoidea	--	-	U	P
**5.	Deschampsia flexuosa	--	-	T	P
6.	Sparganium glomeratum	--	-	SC	P

** Critical Status Species of Estuary.

1 FED = Federal
WIS = Wisconsin
MN = Minnesota
EST = Estuary

E = Endangered
T = Threatened
SC = Special Concern
U = Undetermined

2 R = Resident
P = Past records, but present status unknown

Table B4. Special Status and Other Valuable Bird Species of the St. Louis River Estuary.

	SPECIES	STATUS[1] FED	WIS	MN	AUD	EST[2]
1.	Common Loon	--	SC	--		S,M
2.	Horned Grebe	--	--	SC		S,M
3.	Red-necked Grebe	--	--	--	Bl	M
4.	White Pelican	--	--	SC		M
5	Green Heron	--	--	--		S,M
6.	Great Blue Heron	--	SC	SC		S,M
7.	Black-crowned Night Heron	--	SC	--		M
** 8.	American Bittern	--	--	SC	Bl	S,M
** 9.	Least Bittern	--	--	--	Bl	S,M
10.	Whistling Swan	--	--	--		M
11.	Double-crested Cormorant	--	T	--	Bl	M
12.	Great Egret	--	T	--		SV, M
13.	Canada Goose	--	--	--		SV, M
14.	Mallard	--	--	--		S,M
15.	Black Duck	--	SC	--		S,M
16.	Blue-winged Teal	--	--	--		S,M
17.	Wood Duck	--	--	--		S,M
18.	Ring-neck Duck	--	--	--		S,M
19.	Lesser Scaup	--	--	--		S,M
20.	Hooded Merganser	--	--	--		S,M
21.	Canvasback	--	--	--	Bl	M
22.	Red-breasted Merganser	--	SC	--		W,M
23.	Red-shouldered Hawk	--	--	SC		M
**24.	Bald Eagle	T	E	T	Bl	S,M
25.	Harrier	--	SC	--		M
**26.	Osprey	--	E	SC	Bl	M
27.	Peregrine Falcon	E	E	E		M
28.	Merlin	--	SC	--		M
29.	Marbled Godwit	--	--	SC		M
30.	Wilson's Phalarope	--	--	SC		M
**31.	Piping Plover	--	E	E		S,M
32.	Common Snipe	--	--	--		S,M
33.	Woodcock	-	--	--		S,M
34.	Ring-billed Gull	--	--	--		S,M
35.	Forster's Tern	--	E	SC		M

Table B4.(concluded).

	SPECIES	STATUS[1] FED	WIS	MN	AUD	EST[2]
**38.	Common Tern	--	E	SC	Bl	S,M
39.	Caspian Tern	--	SC	--		M
**40.	Black Tern	--	SC	--	Bl	S,M
41.	Short-eared Owl	--	--	SC		M
42.	Common Flicker	--	SC	--		S,M
**43.	Short-billed Marsh Wren	--	SC	--	Bl	S,M
44.	Eastern Bluebird	--	SC	--		S,M
45.	Loggerhead Shrike	--	--	SC		M
46.	Vesper Sparrow	--	SC	--		S,M
47.	Field Sparrow	--	SC	--		M

** Critical Status Species.

1 FED = Federal
WIS = Wisconsin
MN = Minnesota
AUD = Audubon Society
EST = Estuary

E = Endangered
T = Threatened
SC = Special Concern
Bl = Audubon Blue List

2 S = summer resident
P = permanent resident
M = spring or fall transient
W = winter visitant

Table B5. Special Status and Other Valuable Reptiles, Amphibians, Mammals, and Fish of the St. Louis River Estuary.

	STATUS[1]			
	FED	WIS	MN	EST[2]
Reptiles				
1. Common Snapping Turtle	--	--	SC	C
2. Eastern Garter Snake	--	SC	--	C
3. Northern Red-bellied Snake	--	SC	--	C
4. Wood Turtle	--	E	--	U
Amphibians				
1. Red-backed Salamander	-	-	SC	U
Mammals				
1. Keen's Myotis (bat)	--	--	SC	U
2. Eastern Timber Wolf	E	E	T	V
3. River Otter	--	--	--	U
4. Canada Lynx	--	E	--	U
Fish				
1. Walleyed Pike	--	--	--	C
2. Northern Pike	--	--	--	C
3. Yellow Perch	--	--	--	C

** Critical Status Species.

1 FED = Federal
WIS = Wisconsin
MN = Minnesota
EST = Estuary

E = Endangered
T = Threatened
SC = Special Concern

2 C = Common resident
U = Uncommon to rare resident
V = Rare, non-resident

Appendix C

PERTINENT STATUTES

A large number of federal and state (Minnesota and Wisconsin) statutes exist which are relevant to the management of the natural resources of the St. Louis River estuary. The most important of these and and their general purposes are summarized in Tables C1 and C3. Both Minnesota and Wisconsin rely heavily on permit programs to control and protect their natural resources, especially those related to navigable waters and wetlands. Land and water use is also controlled and guided by the various zoning ordinances of the counties and municipalities involved.

Since the entire Minnesota portion of the estuary lies within the city limits of Duluth, land use in this area is guided by zoning ordinances for the city. Included are ordinances pertaining to shorelands, floodplains, and wetlands. Shoreland and floodplain boundaries have been mapped and classified, however, wetland areas have not. Wetlands protected by state law include types 3, 4, and 5 wetlands as defined in U.S. Fish and Wildlife Circular 39 (Wetlands of the United States, 1971 Edition, U.S. Dept. of Interior). Only wetlands of these types and 2-1/2 acres or more in size are protected. Almost all of the wetland areas in the estuary fall within this category.

All of the Wisconsin portion of the estuary lies within Douglas County, and a large portion is also within the City of Superior. Thus the extreme upper estuary is subject to county zoning ordinances and the remainder to city. of

Table C1. Wisconsin Statutes Relevant to the Natural Resources of the St. Louis River Estuary.

Section 15.34	Established the Department of Natural Resources and specified program responsibilities and powers.
Chapter 23.09	Provides a system for the protection, development, and use of forests, fish and game, lakes, streams, plant life,, and other natural resources.
Chapter 29	Regulates taking of fish and game and provides for protection of endangered species.
Chapter 30	Regulates construction activities and structures in navigable waters.
Chapter 31	Regulates dams and bridges affecting navigable waters.
Section 59.97	Provides for county planning and zoning authority.
Section 59.971	Gives counties the authority to zone shorelands of navigable waters.
Section 70.113	Provides for state aid to municipalities in lieu of taxes for state forests, parks, and hunting and fishing grounds.
Section 87.30	Provides for flood plain zoning by local units of government.
Sections 88.31 - .78	Regulates formation of drainage districts and drainage of lands.
Chapter 144	Authorizes the Department of Natural Resources to protect, maintain, and improve the quality and management of ground and surface waters.
Chapter 147	Establishes a water pollutant discharge elimination system; permits, terms, and conditions.
Chapter 330	Provides for and requires wetland zoning ordinances in municipalities.

Table C2. Minnesota Statutes Relevant to the Natural Resources of the St. Louis River Estuary.

Chapter 84	Established the Department of Natural Resources and specified program responsibilities and powers.
Chapter 97	Provides a system for the protection, development, and use of fish and game.
Chapter 98	Establishes license requirements for the taking of game and fish.
Chapter 99	Provides for establishment and protection of state game refuges,fish refuges, game and fur farms
Chapter 100	Regulates the taking of quadrepeds and birds.
Chapter 101	Regulates the taking of fish.
Chapter 102	Regulates commercial fishing.
Chapter 105	Establishes state control of and policy to protect public waters and wetlands.
Section 104.01	Presents standards for local floodplain zoning ordinances.
Section 105.485	Presents standards for local shoreland zoning ordinances.

Table C3. Federal Statutes Relevant to the Natural Resources of the St. Louis River Estuary.

NAME	
Clean Water Act of 1977	Provides for states to implement permit program for Section 404 of FWPCAA of 1972.
Coastal Zone Management Act of 1972 .	Provides funds for states to develop a coastal management program to control land and water uses.
Endangered Species Act of 1973	Provides for conservation of threatened and endangered species of fish, wildlife, and plants.
Estuary Protection Act of 1968	Authorizes study and inventory of estuaries and cost-sharing agreements with states for permanent.
Federal Aid in Wildlife Restoration Act of 1937	Provides federal aid for wildlife restoration work.
Federal Aid in Fish Restoration Act of 1950	Provides federal aid to states for management and restoration of fish having material value in connection with sport or recreation.
Federal Water Pollution Control Act Amendments of 1972	Regulates point source discharge of wastewater. Regulates discharge of dredged or fill material into nation's waters and contiguous and adjacent wetlands.
Fish and Wildlife Act of 1956	Established agencies now known as U.S. Fish and Wildlife Service and National Marine Fisheries Service.
Fish and Wildlife Coordination Act of 1958	Requires consultation to maintain quality of aquatic environment and protect fish and wildlife resources from water development projects.
Land and Water Conservation Act of 1965	Authorizes matching grants to states for outdoor recreation projects.
Migratory Bird Hunting and Conservation Stamp Act of 1934	Requires waterfowl hunters to purchase a federal hunting stamp; the funds to be used to purchase migratory bird refuges and waterfowl production areas.
Marine Protection Research and Sanctuaries Act of 1972	Designate areas of oceans or Great Lakes for the purpose of preserving or restoring natural values and regulate avtivities to accomplish this.

Table C3. concluded.

National Environmental Policy Act of 1969	Requires environmental values to be given appropriate consideration with economic and technical considerations.
Protection of Migratory Game and Insectivorous Birds	Protects and regulates the taking of migratory birds.
Rivers and Harbors Appropriation Act of 1899	Regulates structures and work in or affecting navigable waters of the U.S.
Water Bank Actof 1970	Allows for contracts with landowners to preserve wetlands and retire adjoining agricultural lands.
Wetlands Act of 1961	Provides a means of accelerating acquisition of migratory waterfowl habitat.

Appendix D

INTERSTATE ISLAND MANAGEMENT PLAN

The plan for this site has not been published before. It is presented here for three reasons:

- it is the most successful site to date in the harbor;
- the phase II development plan for the site should be considered, carefully completed, and implemented; and
- there is a close relationship between this site and the Wisconsin Grassy Point area which is a focal point of this report.

INTERSTATE ISLAND MANAGEMENT PLAN
PHASE I

prepared by the Metropolitan Interstate Committee
a joint planning venture of
the Arrowhead Regional Development Commission
and the Northwest Regional Planning Commission

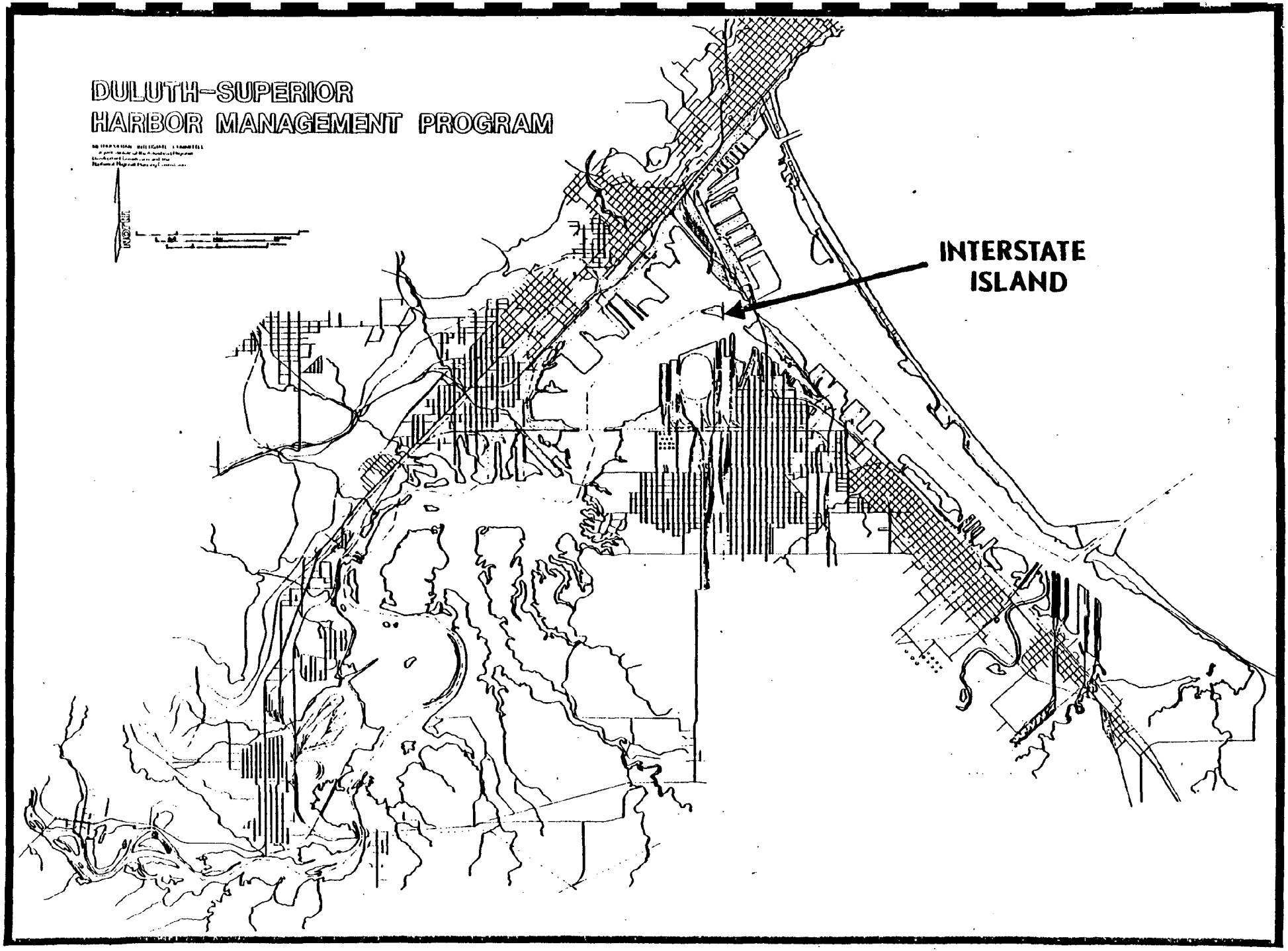
BACKGROUND

The developmental history of the St. Louis River estuary, and in particular the lower portions which are now known as the Duluth-Superior Harbor, is typical of most natural harbors in the United States. Prior to the advent of the modern shipping industry (late 1800's), the river was a marsh-filled estuary characterized by shallow waters (less than 12 feet deep outside the main river channel) and shores lined with wetland vegetation. Although quantitative information is for the most part lacking, early historical accounts indicate that, typical of estuarine systems, the river was a highly productive biological area and supported a diverse and abundant flora and fauna.

Since the mid-1800's, the estuary has undergone significant change, primarily due to extensive development of the lower river as an industrial port. The major alterations which have occurred include the dredging of shipping channels and docking facilities and filling of extensive areas for use as industrial sites. It has been estimated that, of the initial (pre-development) 10,564 acres of open water and wetlands present, over 3,300 have been lost to development. Severe pollution of the river accompanied this rapid growth phase and only exacerbated the adverse impacts of the habitat losses incurred. Although the estuary remains an important and vital fish and wildlife area, both the diversity and abundance of species utilizing it have decreased dramatically due to the above environmental losses.

Despite the fact that the overall environmental impact of these developmental activities has been decidedly negative, there have been some positive, albeit unintentional, effects also. The most apparent of these regards islands formed through the deposition of dredged material within the harbor. Although no natural islands exist in the lower estuary, several man-made ones are present. These include Hog Island, Barkers Island, Hearding Island, and Interstate Island. While formation of these islands contributed to the loss of shallow water habitats, these sites also have a history as important wildlife use areas. In particular, they have provided important nesting habitat for colonial bird species including the common tern and the piping plover (Davis and Niemi, 1979).

The use pattern of these sites by colonial birds has been one in which the birds invade a given island soon after deposition, use the site for a number of years, and then relocate due to encroaching vegetation (the species involved prefer sparsely vegetated or bare substrate for nesting). Since additional material has not been placed on these islands in recent years, they have become heavily vegetated and therefore unusable by the birds.


DULUTH–SUPERIOR
HARBOR MANAGEMENT PROGRAM
INTERSTATE
ISLAND

The need for suitable colonial bird nesting habitat has become crucial in many areas of the United States, including the Great Lakes. As historic nesting sites have been lost to development, these birds have been forced to use marginal habitats, and their breeding populations and/or success have or are in danger of declining markedly in many areas as a result. The situation in the St. Louis River estuary is no exception. At present, essentially all of the common terns and piping plovers nesting in the estuary use one site - the Duluth Port Terminal. This site is an industrial area, and progressive development of this area as well as competition for nesting space with ring-billed gulls pose an increasing threat to the viability of the common tern and piping plover populations. This nesting area certainly cannot be considered one which is secure or one which will be adequate in the future.

In addition, this single colony appears to be important in relation to the entire Great Lakes system. The most recent population data available (Scharf, 1977) indicates that this colony comprises nearly 70 percent of the Lake Superior and 7 percent of the entire Great Lakes breeding population of common terns. Similarly, the few pair of piping plovers present in the colony are a rare occurrence on the Great Lakes.

Both species are endangered in the state of Wisconsin, and preliminary critical species lists for Minnesota include the common tern as threatened and the piping plover as endangered. Their status on a national basis has been of concern for a number of years also, and it now appears that the piping plover will be classified as a federally endangered species in the near future. It thus is important that alternative nesting habitat be provided for these birds as soon as possible, and dredge islands such as Interstate Island, due to their historic importance and relative lack of present use, appear to be prime candidates for such efforts.

PRESENT CONDITIONS

Interstate Island is approximately seven acres in size. It was created through dredged material deposition in the 1930's and is composed of sand, although from three to five inches of humic topsoil has accumulated in some of the wooded areas. The vegetation is primarily upland habitat and includes sapling and pole size hardwoods (Populus spp) and an understory consisting of forbes and patches of dogwood and hazel. In addition, there is a narrow band of brush (speckled alder and willow) along the north shoreline and two small pockets of wet sedge on the east end of the island. No detailed study of the vegetation present has been conducted, but no state or federal endangered or threatened plant species have been found during general reconnaissance by MDNR and WDNR staff.

Although no inventory of wildlife use of the island has been conducted, general observations and the habitats present indicate that it supports common and ubiquitous wildlife species such as songbirds, pheasant, mallard, cottontail rabbit and the like. In the context of the harbor, the island in its present state offers nothing unique or particularly valuable from a wildlife and/or habitat standpoint with the possible exception of the beaches which are used by migratory shorebirds (Niemi et al., 1977). The beach on the north shore is sandy and therefore is the most used in this regard. The beach on the south shore is cobblestone. The adjacent shallow waters, especially on the west shore, are used by waterfowl during the post-breeding and migration

seasons.

This site was designated as an areas ideally suited for natural resource enhancement within the harbor and as a potential colonial bird nesting site in the 1978 land use management plan for the Duluth-Superior harbor. No state or federal endangered or threatened species are known to use the island.

The management plan outlined below deals exclusively with Interstate Island itself and as such represents only a portion of a larger plan, previously proposed, which outlines potential enhancement schemes for the surrounding waters also. The present document is intended to stand on its own and does not imply or require that the larger scheme be adopted or implemented. However, it can be viewed as the first stage of the latter plan and thus is termed Phase I.

GOALS AND OBJECTIVES

General

In accord with the harbor land use management plan, the Interstate Island project (Phase I) has two main purposes:

1. To enhance and expand the natural resource base of St. Louis Bay.

2. To enhance the habitat and overall biological value of Interstate Island in a partial compensation for historic environmental losses in St. Louis Bay due to past developmental activities.

In achieving these aims, the project will also become part of the overall harbor natural resources program (in preparation, MIC). In this way, it will complement programs at Barkers and Hearding Islands and will be implemented as an integral part of the overall environmental plan for the estuary.

Specific

The specific goal of Phase I of this project is to provide suitable nesting and brood rearing habitat for common terns and piping plovers in the St. Louis River estuary. These and other species which may be benefitted are listed in Table 1. To this end the plan includes the following tasks:

1. To formally designate all but a 200 foot strip on the downriver end of Interstate Island as a wildlife management area.[1]

2. To physically alter the present island so as to maximize its value to the target species.

3. To monitor and evaluate the management activities and make recommendations for future efforts.

[1]NOTE: Since the time this plan was originally designed, the BN has proceeded with efforts to remove the Minnesota/Wisconsin Draws bridge. Once that structure has been removed, there will no longer be a need to maintain this buffer zone. At that time it will be cleared for additional habitat.

MANAGEMENT PROGRAM

Designation and General Approach

All but 2 3/4 acres of the island will be jointly designated a wildlife management area by the States of Minnesota and Wisconsin with the Minnesota Department of Natural Resources (MDNR) to become the formal managing agency. That portion of the island which lies between the Burlington Northern Railroad trestle and a line drawn parallel to and 220 feet from the center of said trestle is to serve as a buffer zone and will not be part of the official management area. This includes a portion of the Wisconsin part of the island which is owned by Burlington Northern as well as a portion of that part of the island lying in Minnesota and claimed by the State of Minnesota.

This buffer zone serves two purposes. Firstly, it provides the Burlington Northern Railroad with an area of unrestricted access to their trestle. This should assure them the continued ability to perform routine trestle maintenance or other such activities they deem necessary. Impacts on the adjacent management area should be minimal since previous experience with colonial nesting birds in the harbor indicates that such a buffer zone allows human activity to occur quite near nesting birds without adverse effects. Secondly, this zone should assure Burlington Northern Railroad that additional restrictions will not be placed upon their ability to rebuild the trestle involved.

Within that portion of the island designated a management area (approx. 4 1/4 acres, minimal restrictions will be applied. With some exceptions, no trespass will be permitted during the nesting season (April 15 to August 30). Exceptions to the no trespass season can be made by the managing agency, and special consideration will be given to Burlington Northern Railroad in this regard. If Burlington Northern should have cause for its authorized personnel to be present on the refuge area during this time period, the company shall be allowed such trespass as determined through consultation with the managing agency. Trespass during other times of the year will be allowed, but not encouraged.

Island Characteristics and Management Techniques

The desired physical characteristics island are summarized in Table 2. Most of these have been derived from previous studies of colonial bird use of dredge islands and reflect those conditions which appear best suited to common terns and piping plovers (U.S. Army Corps of Engineers, 1978).

Vegetation

Initally, most of the island will be cleared of all vegetation and whatever topsoil exists, thus presenting a bare, sandy substrate. The exceptions to this are the buffer zone and the outer 200 feet of the upriver point of the island. The purpose of the Buffer Zone has already been discussed. The

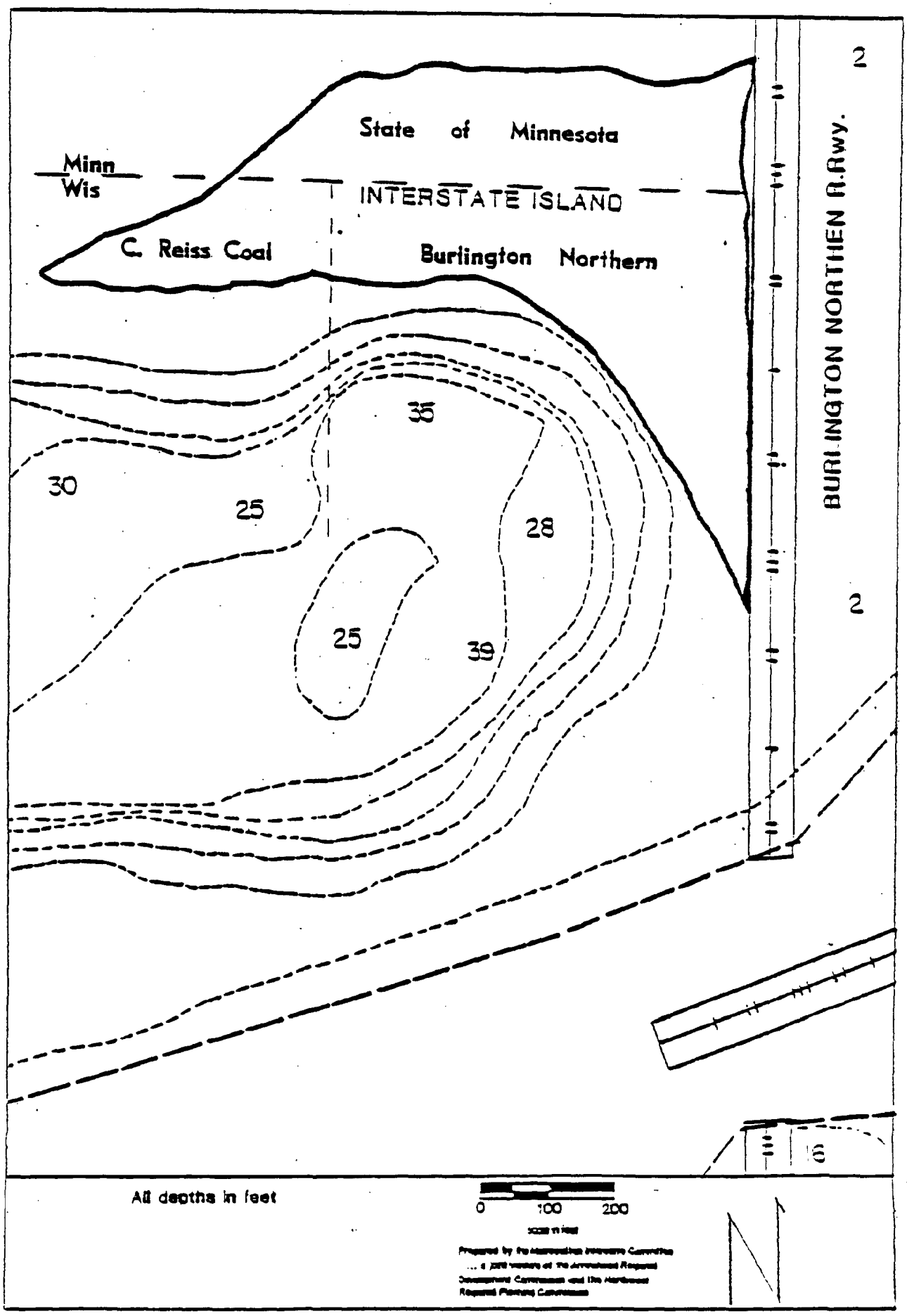
Table 1. Species to be managed (target species) and other species benefited.

MANAGED SPECIES	ADDITIONAL BENEFITED SPECIES
Common Tern (*Sterna hirundo*) (nesting)	waterbird group (for feeding resting and migration stopover)
Piping Plover (*Chardrius melodus*) (nesting)	shorebird group (migration stopover, feeding and resting)

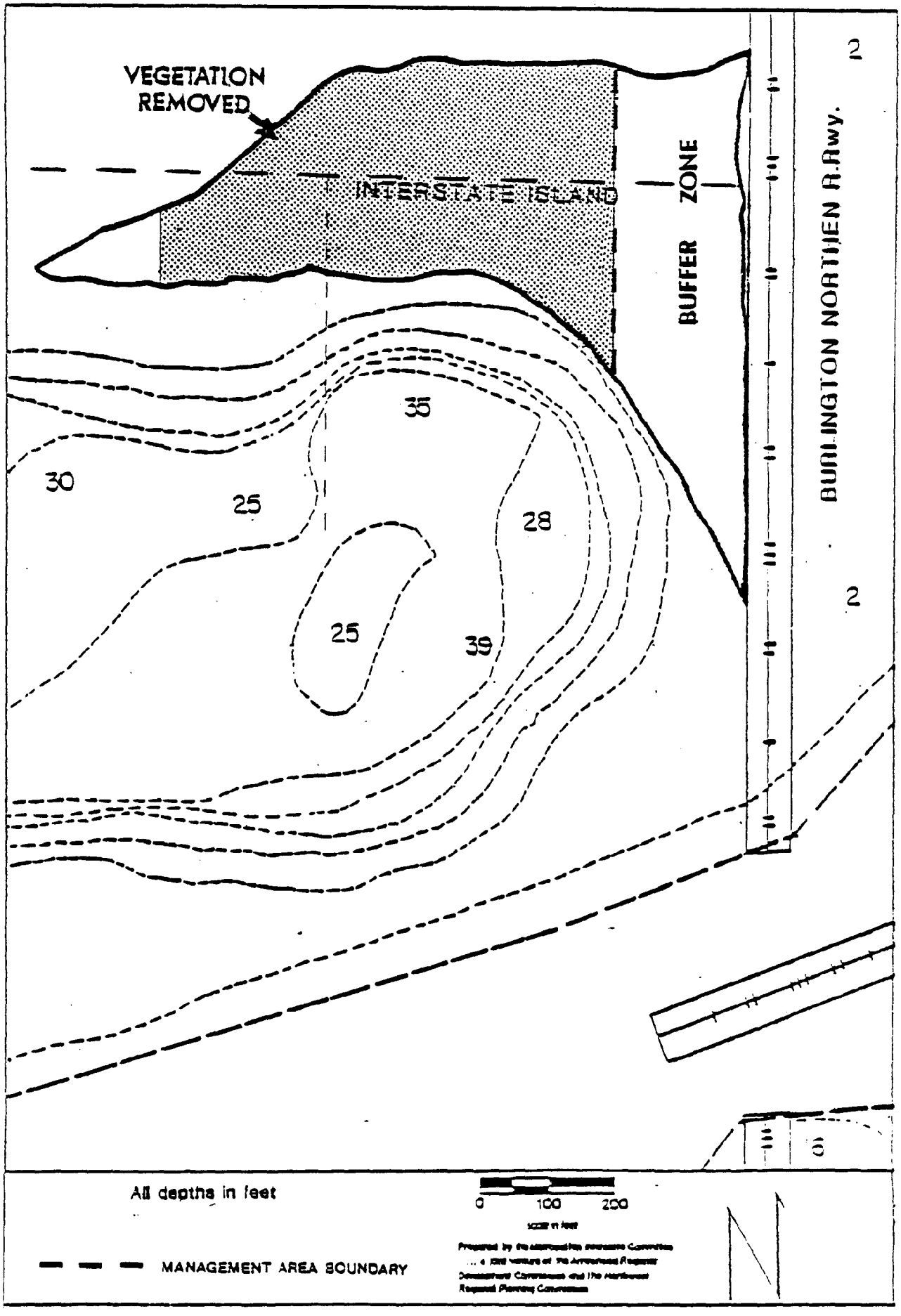
Table 2. Desired physical characteristics of island.

SUBSTRATE	sandy to small size pebbles (present underlying material acceptable)
VEGETATION	a. bare to sparse herbaceous (less than 25% cover) b. less than one meter high c. evenly distributed in vegetated areas
ISLAND SIZE	2-6 hectares (present size acceptable)
ISLAND SHAPE	no preference known for target species, but protected bay useful for secondary user species
TOPOGRAPHY	a. want diversity (e.g., ridges, slopes, etc.) b. maximum elevation to be three meters c. slope generally gradual - along shore prefer about 1:30

APPROXIMATE OWNERSHIP BOUNDARIES



MANAGEMENT AREA LAYOUT



vegetation on the upriver point will be left intact since this area has shown signs of erosion in the past and appears the most likely area for erosion to occur. The continued presence of vegetation should retard this process.

While the long-range plan for the area may include more diverse habitat (e.g., grassy areas for mallard nesting), this will not be part of the initial stages since it may prove a deterent to use by the target species. Once the target species have established themselves, other desired habitats may be allowed to develop through natural succession as determined through ongoing monitoring programs.

Re-vegetation of the management area will be allowed to occur through natural succession until it is apparent that much of the vegetation is approaching unacceptable density, height, etc.. At this time from 50 to 100 % of the area would be cleared again. The proportion to be cleared will depend on whether or not nesting has taken place. If it has, only those areas not used the previous year would be cleared. In this way at least a portion of the nesting area will remain unchanged from year to year, but new, suitable habitat will be provided on an ongoing basis. If no nesting has occurred, all areas deemed unsuitable would be cleared.

All clearing and other site preparation activities will take place outside the nesting season (April 15 to August 30) unless no nesting is apparent during the given year. Since birds are more likely to nest in areas that have had at least a few months to stabilize following clearing activities, the optimum time for clearing and related work is the September-October period rather than early spring.

Initial clearing could be done using a bulldozer, although a variety of techniques are available. The bulldozer or other heavy equipment deemed appropriate could be barged to the island's south shore where water deep enough to allow access exists. The residual woody and herbaceous "scraps" could be burned and then buried on the island. Subsequent clearing could occur in a similar fashion, although the use of a small tractor and harrow would probably suffice since woody vegetation would for the most part be absent following the initial clearing operation. Other techniques which could be considered include hand clearing, fire, tiller, herbicide, etc.

Island Size

Interstate Island presently is of the size class considered optimum for colonial bird nesting. Larger islands often present problems in that theycan support predator populations and smaller ones provide limited space for nesting and limit management options such as clearing parts of the island on a rotating basis. Thus Interstate Island will remain unchanged in this respect.

The major concerns with respect to maintaining the present size of the island are the erosional impacts of waves, ice, and wind. Historic aerial photos of the site indicate that, with the exception of the point extending upriver, it has remained essentially unchanged for over 10 years; and even the latter

point has not changed appreciably since 1978. For this reason no erosion protection is recommended at this time.

Overall Island Shape

There is no evidence to indicate that the target species will show any preference with respect to the gross shape of the island; however, secondary user species (e.g., shorebirds) may. If island shape is to be changed from the present, inclusion of a bay and thus quiet water would be desirable. The best location for a bay appears to be the south edge of the island which already has a concave shoreline. The north shoreline, although stable, does appear to be impacted by ice in that a two foot ridge is present along the upper edge of the shore. It does not appear to be suitable for bay development since it seems likely that the same forces acting upon it at present would continue to do so and would counteract these efforts. Should future plans include development of additional islands or other features which would protect this shore from erosion, inclusion of further shoreline features could be considered.

Island Topography

Several factors contribute to the determination of the appropriate island topography. In general, it is desirable to have some diversity (i.e., relief). This is not because the target species appear to prefer particular topographic features, but because ridges, mounds, and other such features affect the vegetation, and the birds do respond to the latter. Topographic and therefore habitat diversity becomes even more important in a case such as the present management plan where two target species, with slightly different microhabitat preferences, are involved. Ideally the island will provide adequate amounts of both sparsely vegetated and bare substrates and thus potentially support both piping plover and common tern nesting.

Encroaching vegetation typically shows a steady progression from the bottom of slopes to the top. Thus, incorporation of relief features will provide several stages in vegetation development. This should insure that the substrates desired by each species are present and that that they will be present over longer periods of time than would be true with a "flat" island. There is some evidence to indicate that relief features also have value in that they may provide natural definition of adjacent territories within the colony.

The elevation of the island is an important design parameter. As in the case of other topographic features, its importance primarily relates to its impact on vegetation. In addition to direct effects such as the wetness of the soils, etc., elevation is a major determinant of the extent of wind erosion which will occur. Previous work with dredge islands indicates that the usable elevations fall within the one to three meter range. The higher the island, the more erosion it is subjected to and the slower the encroachment of vegetation. Since the target species prefer bare to sparsely vegetated

substrates, an elevation near the recommended maximum (three meters) is preferred for Interstate Island. Should wind erosion prove to be a problem, additions of coarser substrate material (e.g., gravel) which are more resistant to such effects or select plantings would be indicated.

It also is important that there be unobstructed visibilty and access from the nesting area to the shore. The species involved seem to prefer an extremely large angle of vision (from 270 to 360 degrees) and thus points, peninsulas, and similar configurations are preferred.

The other important island configuration factor is the overall slope - of both the island and the adjoining waters. Experience has shown that gradual slopes are definitely preferred by colonial nesting birds. Diked islands receive far less use than islands with natural slopes. Slopes of approximately 1:30 have been recommended by some researchers.

Overall, Interstate Island should easily accomodate the above preferences in topography. Initial clearing could incorporate the necessary grading to create the desired features. The existing extensive shallow waters adjacent to the island are suitable and should not require change, although reduction in depth and/or grade would not be detrimental.

PERMITTING

The following permit procedures will be required to implement this plan:

1. A permit for the initial clearing and grading of the island is required under Wisconsin statute 30.19(1)(c). A memorandum of agreement with the apparent riparian owner or a joint application by all riparians associated with the island would suffice. No permit for this activity is required by Minnesota law, although City of Duluth zoning ordinances may require a use permit and hearing. Initial indications from the city are that they will not require a permit since the land in question will be owned by the MDNR, The city's position remains to be clarified.

2. Should riprap or other erosion control measures be neccessary (e.g., on the upriver point), a permit under Wisconsin statute 30.12 would be required. This would have to be issued to the riparian owner and would thus require an exact determination of ownership boundaries (i.e., land survey) to be made. No such permit is presently required since erosion control is not part of the existing plan. No permit for this activity is required by Minnesota law, but as with the previous item, City of Duluth zoning ordinances, if applicable, would require a use permit.

SIGNING

Signs shall be created and erected which identify the area and indicate it's purpose. Any restrictions, especially as pertain to trespass, and the enforcing agency will be indicated. These signs will be posted around the perimeter of the island such that anyone approaching it will be able to read them from a reasonable distance (e.g., 50 feet). Perimeter spacing of signs in similar situations has been on the order of 100 feet.

PUBLIC AWARENESS AND EDUCATION

To insure the success of the project, the general public, especially that segment which uses the harbor, must be made aware of the existence of the management area and its purpose. This is advisable during both the developmental and actual management stages. In particular, anglers, birdwatchers, and general recreationists should be told of the enhancement efforts so that they can take full advantage of the added value of the site and be sensitive to the restrictions and precautions neccesary for its proper management.

RESEARCH/MONITORING/LONG-RANGE PLANNING

Research and monitoring programs will be needed to evaluate the effectiveness of the project as well as to determine any modifications of the management plan which may be required. These programs will also provide information required to determine when future habitat modifications are needed. These monitoring and evaluation programs should be performed on an annual basis by the managing agencies and/or in cooperation with the local universities or other parties deemed acceptable by the managing agencies.

IMPLEMENTATION

Implementation of this management program requires coordination between several parties, but primarily the MDNR, the WDNR, and the property owners of the Wisconsin portion of the island (i.e., Burlington Northern Railroad and C. Reiss Coal Co.). The major steps in establishing and developing the area are noted below:

1. Designation - the two DNRs have given full support to the project and have informally accepted a common management scheme for the island as presented in the foregoing sections of this document. It remains for them to formally adopt this plan to jointly designate the management area. The MDNR will be the formal managing agency, although management of the island will continue to be a cooperative effort between the MDNR and the WDNR.

2. Ownership - in designating the area a wildlife management area, the states must claim their portions of the island and/or negotiate memorandum agreements with the present owners. Minnesota has tentatively claimed its

portion of the island, but formal action is still required. Once this action is completed, the ownership can be transferred internally to the MDNR. The Wisconsin portion of the island is owned by the riparians which are Burlington Northern Railroad and C. Reiss Coal Co.. These parties are presently formalizing claims to their respective portions of the island. Once these are completed, the appropriate agreements or transfers of ownership will have to be made. These require that a land survey in which ownership boundaries are delineated be performed. The MDNR has assumed responsibility for this task.

Burlington Northern Railroad has expressed a desire to maintain owwnership of its portion of the island, but also has indicated it will cooperate with the managing agency in facilitating an appropriate lease or easement exchange as outlined in this document. In this light, Burlington Northern will retain all present rights and privileges regarding their property lying in the Wisconsin portion of the buffer zone, and similar rights and privileges will be accorded them in the Minnesota portion of the buffer zone by the State of Minnesota. Since State of Minnesota policy precludes transfer of ownership with respect to this property, negotiation of easement rights, lease, or other means of conveyance deemed appropriate by the two parties will be used. In a similar fashion, the Burlington Northern Railroad will give easement rights, lease, or convey through other means deemed appropriate, rights and privileges regarding that portion of their holding lying inside the designated management area to the managing agency such that said agency has the ability to manage the area in accord with this management plan.

C. Reiss Coal has informally expressed a desire to cooperate in implementation of this plan. Its shoreline property which infers ownership on the island is presently under lease to Edison Electric, and the companies are presently conferring to determine their stance with respect to the island. Once this has been completed and all the legal ramifications clarified, it is anticipated that a transfer of ownership or appropriate lease or easement aggrement will be negotiated between the MDNR and C. Reiss Coal.

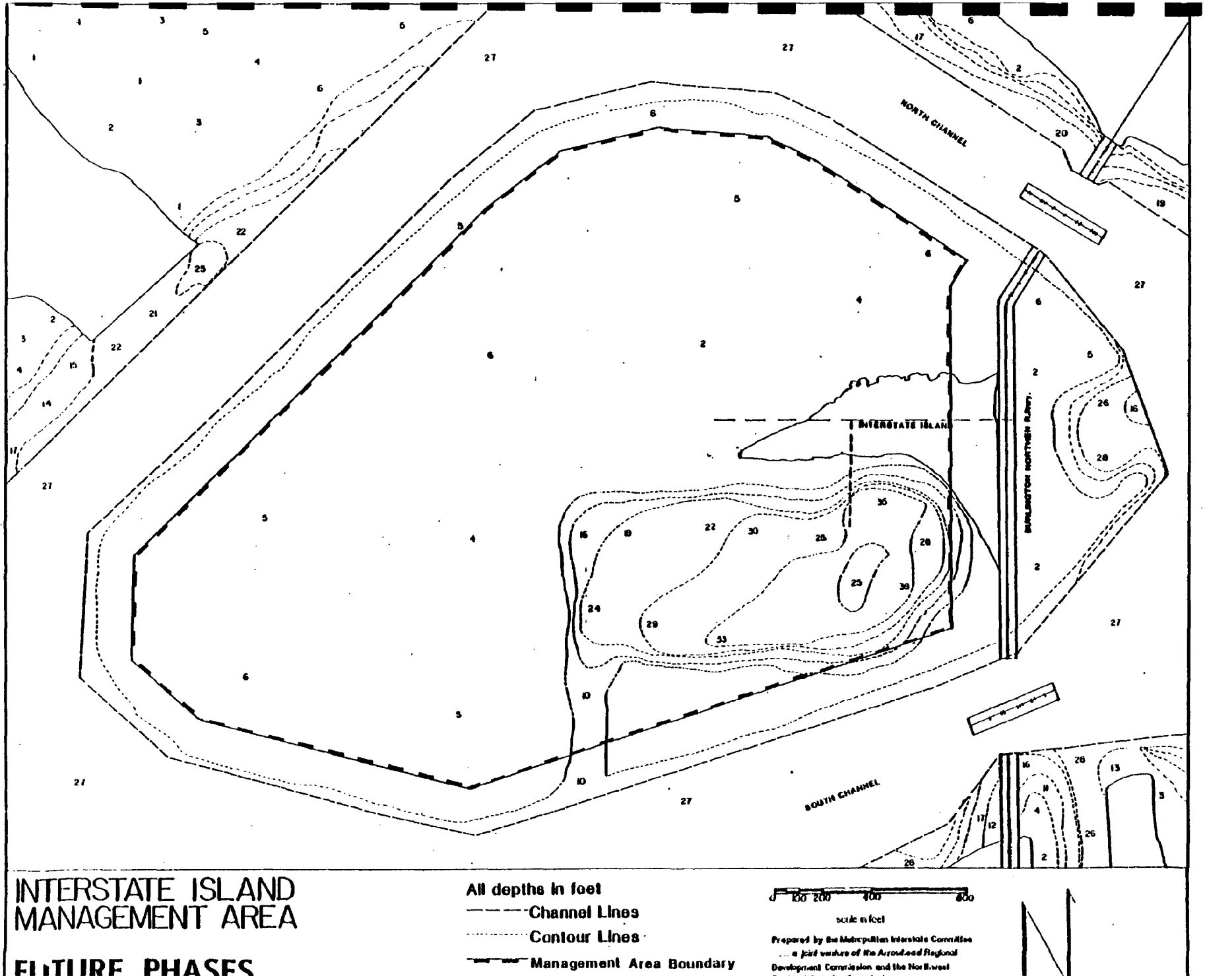
FUTURE PHASES

In addition to the island, the large expanse of shallow water surrounding it has been considered for enhancement projects. Possible uses of this area have been delineated in the harbor land use plan and the harbor natural resources program. These proposals view the area as one for development of diverse wildlife habitats including wetlands, mudflats, submerged aquatic beds, and additional upland sites (i.e., additional islands). The list of species which would be benefited is quite long, but in general includes migrating shorebirds, migrating and breeding waterfowl, and several fish species.

With one exception, the boundary of this proposed management area is a line running parallel to and 200 feet to the Interstate Island side of the shipping lane boundaries. The exception is that area along the Burlington Northern bridge in which the boundary is a line running parallel to and 220 feet from the bridge. The latter line is an extension of the line demarcating the Buffer Zone as outlined in this document (Phase I). This should avoid any

conflict with future improvements, widening, etc. of the present shipping lanes.

Implementation of the above program is strongly encouraged since it offers a unique opportunity to recover past environmental losses and to provide a valuable wildlife area in this otherwise highly developed portion of the estuary. Thus it is recommended that an effort be initiated to develop a comprehensive plan for the area, and that once such a plan is formulated and adopted by the appropriate agencies and governmental units, it be implemented.



INTERSTATE ISLAND MANAGEMENT AREA

FUTURE PHASES

All depths in feet

Channel Lines

Contour Lines

Management Area Boundary

0 100 200 400 600

scale in feet

Prepared by the Metropolitan Interstate Committee ... a joint venture of the Arrowhead Regional Development Commission and the Northwest

REFERENCES

Davis, T. and G.J. Niemi. 1979. Larid breeding populations at the western tip of Lake Superior. Loon 52(1):3-14.

Metropolitan Interstate Committee. 1978. Land use and management plan for the Duluth-Superior harbor. Duluth, MN. 82 pp. and appendices.

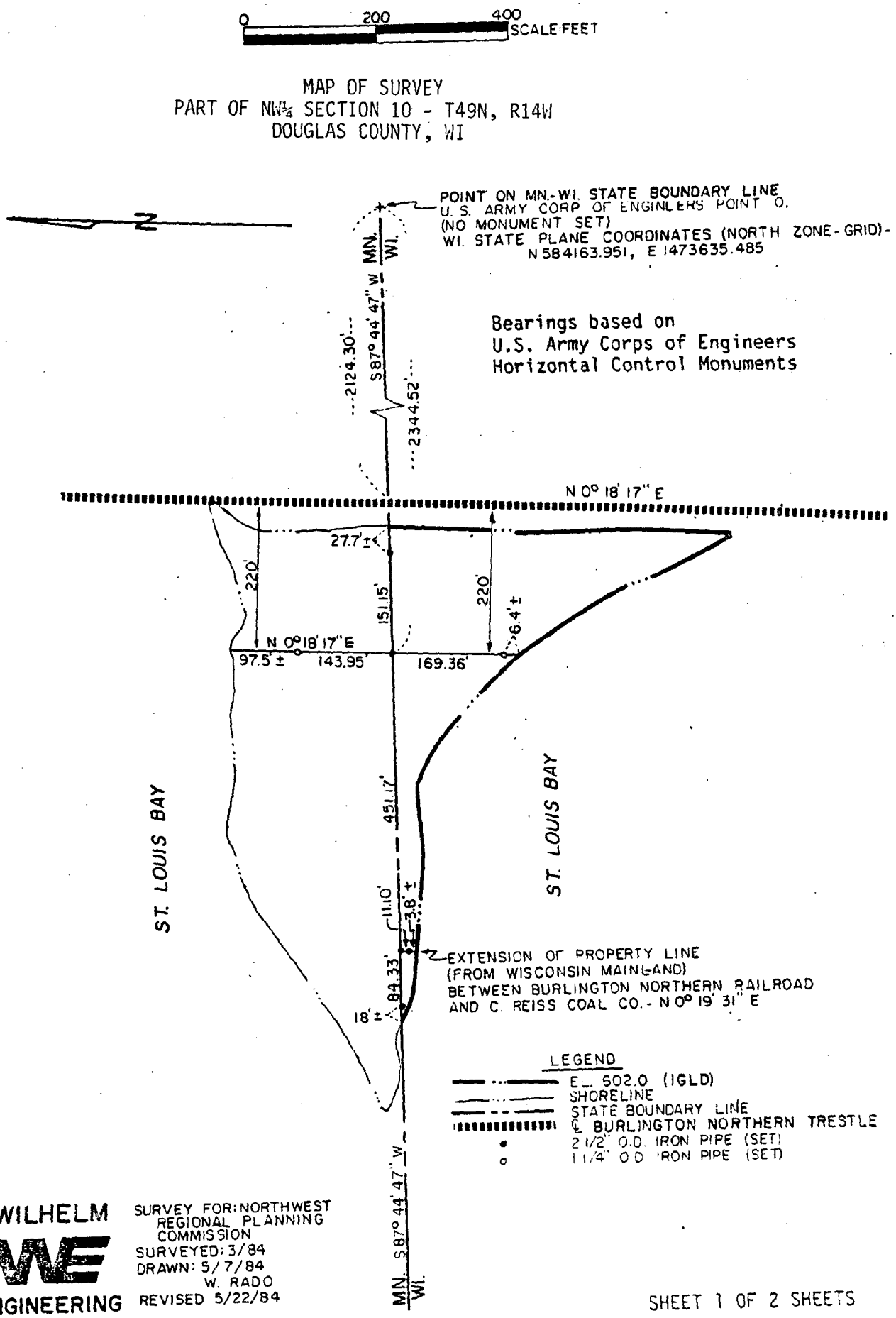
Niemi, G.J., T.E. Davis, J. Kotar, and P.B. Hofslund. 1977. Assessment of habitat types and bird populations in the Duluth-Superior harbor. Report to the Metropolitan Interstate Committee, Duluth, MN. 75 pp. and appendices.

Scharf, W.C. 1978. Colonial birds nesting on man-made and natural sites in the U.S. Great Lakes. U.S. Army Corps of Engineers Technical Report D-78-10. 136 pp. and appendices.

Soots, R.F. Jr. and M.C. Landin. 1978. Development and management of avian habitat on dredged material islands. U.S. Army Corps of Engineers Technical Report DS-78-18. 96 pp. and appendices.

MAP CORRECTION

A survey of Interstate Island was undertaken as part of the work on the island. The following map correctly shows the location of the state line between Wisconsin and Minnesota.


0
200
400
SCALE: FEET
MAP OF SURVEY
PART OF NW¼ SECTION 10 - T49N, R14W
DOUGLAS COUNTY, WI
N
POINT ON MN.-WI. STATE BOUNDARY LINE
U. S. ARMY CORP OF ENGINEERS POINT O.
(NO MONUMENT SET)
WI. STATE PLANE COORDINATES (NORTH ZONE - GRID) -
N 584163.951, E 1473635.485
MN.
WI.
S 87° 44' 47" W
2124.30'
2344.52'
Bearings based on
U.S. Army Corps of Engineers
Horizontal Control Monuments
N 0° 18' 17" E
27.7'±
220'
151.15'
220'
6.4'±
N 0° 18' 17" E
97.5'±
143.95'
169.36'
ST. LOUIS BAY
ST. LOUIS BAY
451.17'
11.10'
3.8'±
84.33'
18'±
EXTENSION OF PROPERTY LINE
(FROM WISCONSIN MAINLAND)
BETWEEN BURLINGTON NORTHERN RAILROAD
AND C. REISS COAL CO. - N 0° 19' 31" E
LEGEND
EL. 602.0 (IGLD)
SHORELINE
STATE BOUNDARY LINE
℄ BURLINGTON NORTHERN TRESTLE
2 1/2" O.D. IRON PIPE (SET)
1 1/4" O.D. IRON PIPE (SET)
MN.
WI.
S 87° 44' 47" W
WILHELM
ENGINEERING
SURVEY FOR: NORTHWEST
REGIONAL PLANNING
COMMISSION
SURVEYED: 3/84
DRAWN: 5/7/84
W. RADO
REVISED 5/22/84
SHEET 1 OF 2 SHEETS

Appendix E

WISCONSIN GRASSY POINT MANAGEMENT PLAN

The following is the complete draft of the proposed management plan for the Wisconsin Grassy Point Wildlife Management Area.

WISCONSIN GRASSY POINT
-Draft-

BACKGROUND

The developmental history of the St. Louis River estuary, and in particular the lower portions which are now known as the Duluth-Superior Harbor, is typical of most natural harbors in the United States. Prior to the advent of the modern shipping industry (late 1800's), the river was a marsh-filled estuary characterized by shallow waters (less than 12 feet deep outside the main river channel) and shores lined with wetland vegetation. Although quantitative information is for the most part lacking, early historical accounts indicate that, typical of estuarine systems, the river was a highly productive biological area and supported a diverse and abundant flora and fauna.

Since the mid-1800's, the estuary has undergone significant change, primarily due to extensive development of the lower river as an industrial port. The major alterations which have occurred include the dredging of shipping channels and docking facilities and filling of extensive areas for use as industrial sites. It has been estimated that, of the initial (pre-development) 10,564 acres of open water and wetlands present, over 3,300 have been lost to development. Severe pollution of the river accompanied this rapid growth phase and only exacerbated the adverse impacts of the habitat losses incurred. Although the estuary remains an important and vital fish and wildlife area, both the diversity and abundance of species utilizing it have decreased dramatically due to the above environmental losses.

Despite the fact that the overall environmental impact of these developmental activities has been decidedly negative, there have been some positive, albeit unintentional, effects also. The most apparent of these regards islands formed through the deposition of dredged material within the harbor. Although no natural islands exist in the lower estuary, several man-made ones are present. These include Hog Island, Barkers Island, Hearding Island, and Interstate Island. While formation of these islands contributed to the loss of shallow water habitats, these sites also have a history as important wildlife use areas. In particular, they have provided important nesting habitat for colonial bird species including the common tern and the piping plover (Davis and Niemi, 1979).

The use pattern of these sites by colonial birds has been one in which the birds invade a given island soon after deposition, use the site for a number of years, and then relocate due to encroaching vegetation (the species involved prefer sparsely vegetated or bare substrate for nesting). Since additional material has not been placed on these islands in recent years, they have become heavily vegetated and therefore unusable by the birds.

The need for suitable colonial bird nesting habitat has become crucial in many areas of the United States, including the Great Lakes. As historic nesting sites have been lost to development, these birds have been forced to use marginal habitats, and their breeding populations and/or success have or are in danger of declining markedly in many areas as a result. The situation in the St. Louis River estuary is no exception. At present, essentially all of the common terns and piping plovers nesting in the estuary use one site - the Duluth Port Terminal although recent activities have caused common terns to begin nesting at Interstate Island. This site is an industrial area, and progressive development of this area as well as competition for nesting space with ring-billed gulls pose an increasing threat to the viability of the common tern and piping plover populations. This nesting area certainly cannot be considered one which is secure or one which will be adequate in the future.

In addition, this single colony appears to be important in relation to the entire Great Lakes system. The most recent population data available (Scharf, 1977) indicates that this colony comprises nearly 70 percent of the Lake Superior and 7 percent of the entire Great Lakes breeding population of common terns. Similarly, the few pair of piping plovers present in the colony are a rare occurrence on the Great Lakes.

Both species are endangered in the state of Wisconsin, and preliminary critical species lists for Minnesota include the common tern as threatened and the piping plover as endangered. Their status on a national basis has been of concern for a number of years also, and it now appears that the piping plover will be classified as a federally endangered species in the near future. It thus is important that alternative nesting habitat be provided for these birds as soon as possible.[1]

PRESENT CONDITIONS

The site consists of an extensive shallow water area stretching from a series of old wooden pilings on the eastern edge just downriver of the Bong Bridge to just downriver of the old Arrowhead Bridge. The shallowness of the area is due to past dredged material disposal, primarily in the early and mid-1960's.

Besides the open shallow water, the area includes an emergent woody marsh and mudflat area. The shoreline is predominantly weedy field, although a small area of hardwood forest exists near the Burlington Northern railroad bridge.

Present human use of the area is minimal. A temporary roadway had been constructed to facilitate construction of the Bong Bridge; the

---

[1]This material comes virtually unchanged from the Interstate Island plan (MIC).

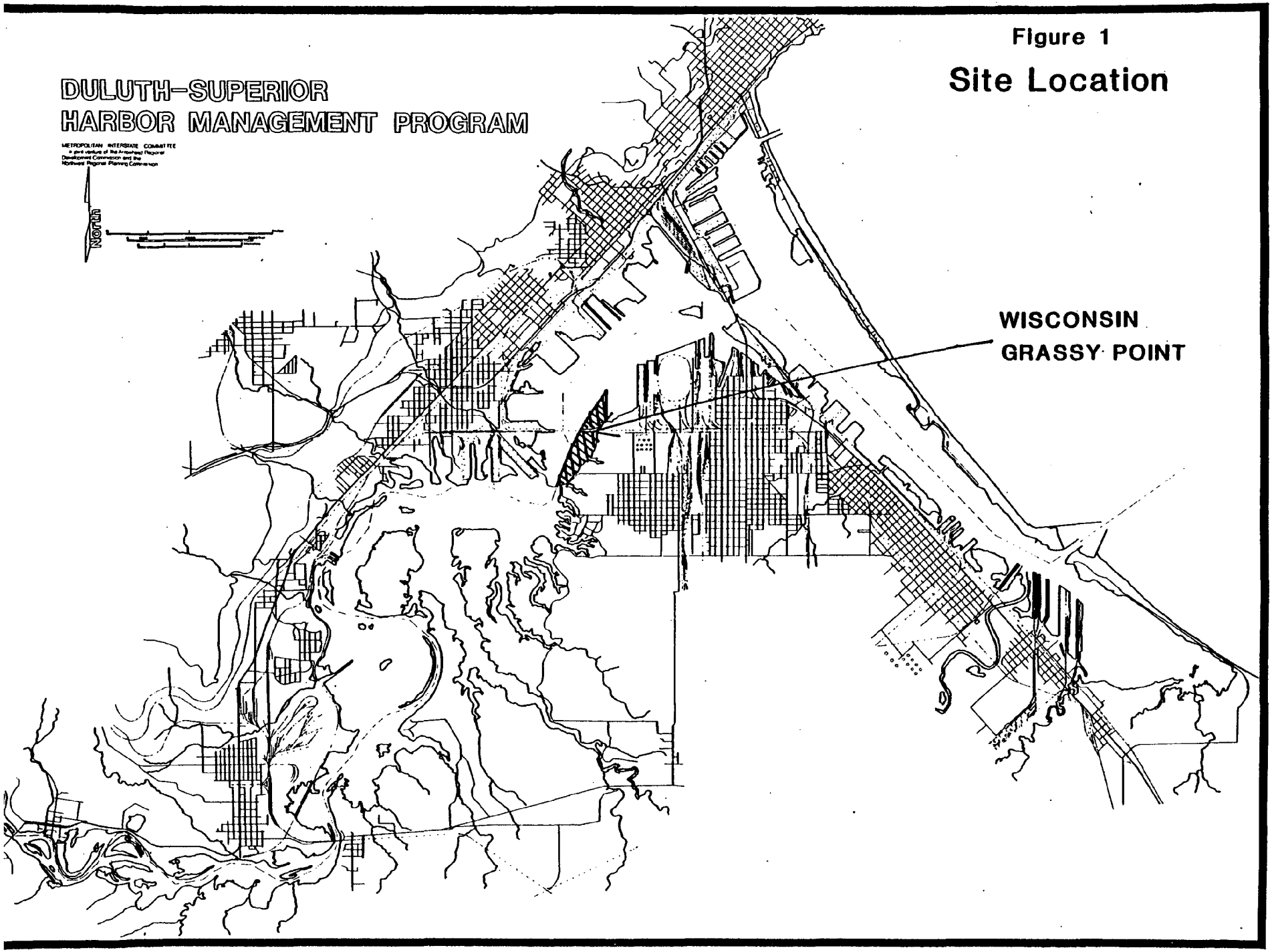


Figure 1

Site Location

road has been removed. Douglas County owns most of the land downriver of the BN bridge while the City of Superior owns the upriver portion.

The most important natural resource value of this parcel is its use by fish, particularly walleye, northern pike, yellow perch and an occasional muskellunge. Depending on the species, the area is used as a spawning ground, feeding, or nursery area. Probably the most important fish usage is as a major northern pike spawning site. The WDNR has determined that the area is one of only two such areas known in the lower estuary.

The emergent woody marsh and mudflats are also unique in the harbor and comprise an important habitat resource.

GOALS AND OBJECTIVES

General

In accord with the harbor land use and management plan, the Wisconsin Grassy Point program has two primary goals:

1. To enhance and expand the natural resource base of St. Louis Bay.

2. To enhance the habitat and overall biological value of Wisconsin Grassy Point in partial compensation for historic environmental losses in St. Louis Bay due to developmental activities.

Attaining these goals will be done in a manner that fulfills the harbor plan and in coordination with the overall management of key natural resources within the harbor.

Specific

Active management of the site centers on providing suitable nesting and brood rearing habitat for common terns and piping plovers. Secondary benefitting species are also listed in Table 1. These activities will be done in such a manner so as to enhance the habitat (spawning, young-of-the-year nursery, and feeding) for the fish species which currently make heavy use of the area.

Passive management of the site focuses on maintaining the quality wetland, shoreland and aquatic habitat for birds, small mammals, amphibians and fish.

The plan has among its specific tasks the following:

1. Formally designate entire site, shoreland, open waters, and the new island as a wildlife management area.

2. Acquire or otherwise gain control of the site.

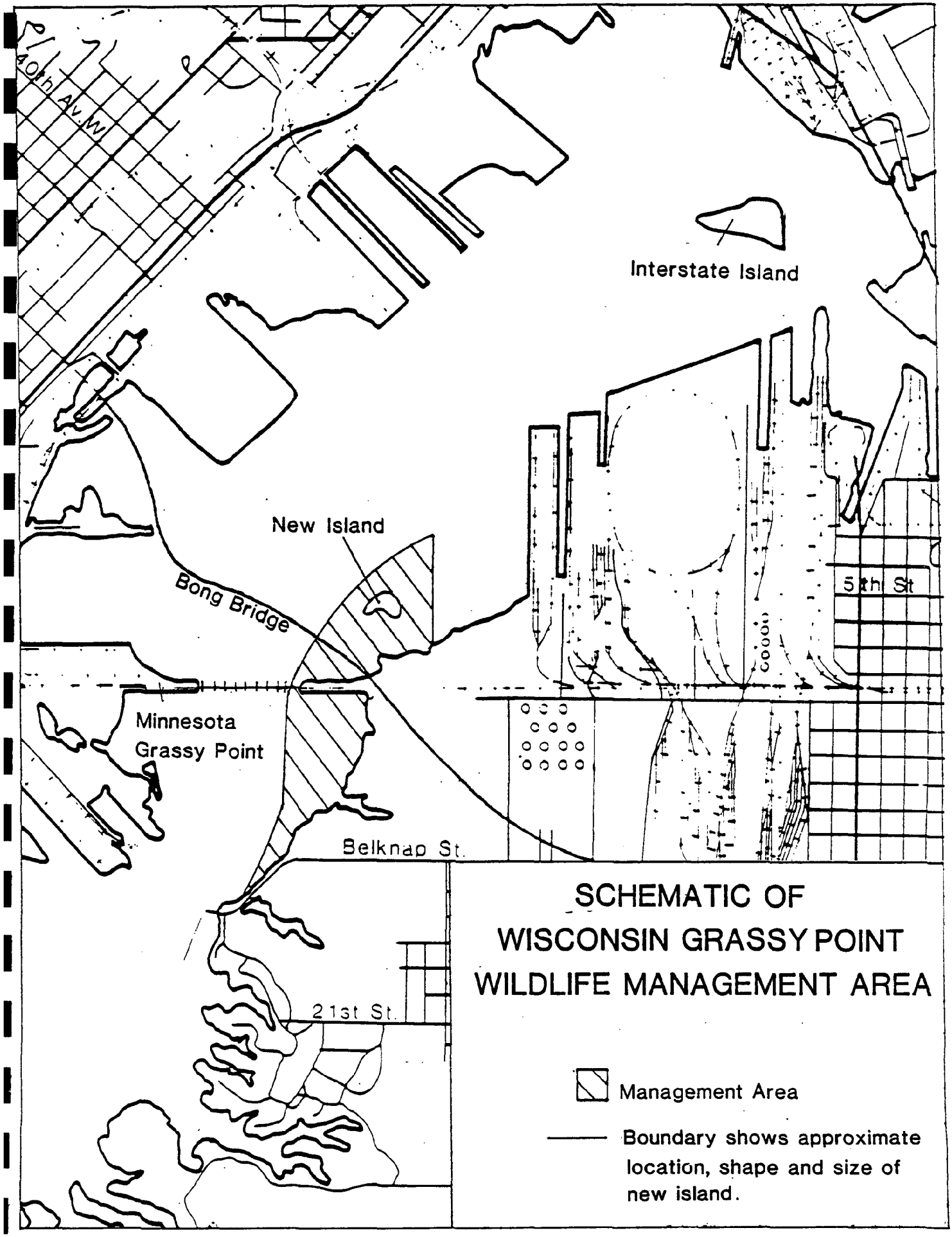
3. Create a 1-3 acre island located and designed so as to maximize its value to the target species and to permit enhancement of the entire management area.

Table 1. Species to be managed (target species) and other species benefited.

MANAGED SPECIES	ADDITIONAL BENEFITED SPECIES
Common Tern (Sterna hirundo) (nesting)	waterbird group (for feeding resting and migration stopover)
Piping Plover (Chardrius melodus) (nesting)	shorebird group (migration stopover)

Table 2. Desired physical characteristics of island.

SUBSTRATE	sandy to small size pebbles (present underlying material acceptable)
VEGETATION	a. bare to sparse herbaceous (less than 25% cover) b. less than one meter high c. evenly distributed in vegetated areas
ISLAND SIZE	2-6 hectares
ISLAND SHAPE	no preference known for target species, but protected bay useful for secondary user species
TOPOGRAPHY	a. want diversity (e.g., ridges, slopes, etc.) b. maximum elevation to be three meters c. slope generally gradual - along shore prefer about 1:30


40th Av W
Interstate Island
New Island
Bong Bridge
5th St
Minnesota
Grassy Point
Belknap St.
21st St.
SCHEMATIC OF
WISCONSIN GRASSY POINT
WILDLIFE MANAGEMENT AREA
Management Area
Boundary shows approximate location, shape and size of new island.

4. Maintain existing shallow water and shoreland areas.

5. Investigate fish habitat improvement activities for use on the site.

6. Monitor and evaluate management activities and make recommendations for future efforts.

MANAGEMENT PROGRAM

General Approach

The entire parcel is to be designated and managed. Given the intent of the area, only minimal restrictions will be applied. The new island will have the most restriction - during the nesting season (April 15 to August 30) no trespass will be permitted except by management personnel. Trespass during other times of the year will be allowed but not encouraged.

Site Characteristics and Management Techniques

Since active managment will only occur on the newly created island, the attention of this section will be limited to it. Table 2 summarizes the desired physical characteristics of the island. This information has been derived from work by the U.S. Army Corps of Engineers, prior work in the harbor, and programs undertaken elsewhere in the nation.

Vegetation

Because it will be a newly created island, it will be clear of all vegetation and possess a bare, sandy substrate. While long-range plans for the area may include more diverse habitat (e.g., grassy areas for mallard nesting), this will not be part of the initial stages since it may prove a deterent to use by the target species. Once the target species have established themselves, other desired habitats may be allowed to develop through natural succession as determined through ongoing monitoring programs.

Re-vegetation of the management area will be allowed to occur through natural succession until it is apparent that much of the vegetation is approaching unacceptable density, height, etc. At that time from 50 to 100% of the area would be cleared again. The proportion to be cleared will depend on whether or not nesting has taken place. If it has, only those areas not used the previous year would be cleared. In this way at least a portion of the nesting area will remain unchanged from year to year, but new, suitable habitat will be provided on an ongoing basis. If no nesting has occurred, all areas deemed unsuitable would be cleared.

All clearing and other site preparation activities will take place outside the nesting season (April 15 to August 30) unless no nesting is apparent during the given year. Since birds are more likely to nest in areas that have had at least a few months to stabilize following clearing activities, the optimum time for clearing and related work is the September-October period rather than early spring. This clearing would likely be done with the use of a small tractor and harrow since woody vegetation should be absent. Other techniques which could be considered include hand clearing, fire, tiller, and herbicide.

Island Size

The new island will be on the lower end of the optimum size scale. Clearly, a large island is not desired as large ones can support predator populations. Small ones do pose problems related to limited space for nesting and reducing management options for such things as clearing sections of the island on a rotating basis.

However, the smaller size of 1-1.5 hectares (1-3 acres; with three being preferred) is based on the fact that this will be a created island most likely built at a direct cost (and not like the others as a by-product of dredging operations).

Island Shape

Prior experience and the literature offer no evidence to indicate that the target species show any preference with respect to the general shape of the island. Secondary species and fish, however, may benefit from shape considerations. The likely design feature to be included is a small bay to provide quiet water and to foster aquatic vegetation. The bay is to be situated on the back, or south, side of the island.

Erosion should not be a problem given the slope of the island and the extensive surrounding shallow water. If this becomes a problem, then protective measures (riprapping, off shore reefs and the like) will have to be evaluated for use.

Island Topography

Several factors contribute to the determination of the appropriate island topography. In general, it is desirable to have some diversity (i.e, relief). This is not because the target species appear to prefer particular topographic features, but because ridges, mounds, and other such features affect the vegetation, and the birds do respond to the latter. Topographic and therefore habitat diversity becomes even more important in a case such as the present management plan where two target species, with slightly different microhabitat preferences, are involved. Ideally the island will provide adequate amounts of both sparsely vegetated and bare substrates and thus potentially support both piping plover and common tern nesting.

Encroaching vegetation typically shows a steady progression from the bottom of slopes to the top. Thus, incorporation of relief features will provide several stages in vegetation development. This should insure that the substrates desired by each species are present and that they will be present over longer periods of time than would be true with a "flat" island. There is some evidence to indicate that relief features also have value in that they may provide natural definition of adjacent territories within the colony.

The elevation of the island is an important design parameter. As in the case of other topographic features, its importance primarily relates to its impact on vegetation. In addition to direct effects such as the wetness of the soils, etc., elevation is a major determinant of the extent of wind erosion which will occur. Previous work with dredge islands indicates that the usable elevations fall within the one to three meter range. The higher the island,

the more erosion it is subjected to and the slower the encroachment of vegetation. Since the target species prefer bare to sparsely vegetated substrates, an elevation near the recommended maximum (three meters) is preferred for Interstate Island. Should wind erosion prove to be a problem, additions of coarser substrate material (e.g., gravel) which are more resistant to such effects or select plantings would be indicated.

It also is important that there be unobstructed visibility and access from the nesting area to the shore. The species involved seem to prefer an extremely large angle of vision (from 270 to 360 degrees) and thus points, peninsulas, and similar configurations are preferred.

The other important island configuration factor is the overall slope - of both the island and the adjoining waters. Experience has shown that gradual slopes are definitely preferred by colonial nesting birds. Diked islands receive far less use than islands with natural slopes. Slopes of approximately 1:30 have been recommended by some researchers.

Being a created island, the new one can be shaped at the time of construction to optimal contours. The shallow waters at the site, while maybe causing problems for construction, should prove ideal for blending the island into the existing setting.

Construction of Island

An engineering firm was retained to evaluate means of constructing the island. Their report is attached as an appendix to this document.

The location of the proposed new island makes certain construction techniques difficult while assisting in others. The firm reviewed three techniques:

1. using material from dredging operation and designating the site as a direct disposal area;

2. truck material from an upland stockpile over winter time ice and deposit on the ice;

3. conduct a special dredging project just for creating the island.

Of the options, the first two appear the most desirable as the third is by far the most expensive. The trucking option would be the easiest, both in terms of operation and most likely environmental controls, to implement. The first, which would require close coordination with a dredging project and more extensive environmental reviews; is the least expensive.

If the first option can be exercised using acceptable material and disposal operations, it should be used. It permits a quick development schedule, re-uses dredged material, and curtails dredging costs; it also introduces the possibility of having the dredging project pay for the island creation costs.

If that option cannot be used, then the trucking alternative should be used.

Use of either method implies that all environmental regulations are satisfied during the construction period.

Permitting

Creating the island will require a careful use of existing Wisconsin law and an agreement between the WDNR and the City of Superior.

Wisconsin law does not permit the creation of islands as such. However, under Wisconsin Statute, Chapter 30, a legal bulkhead line can be established by the City behind which line fill-material can legally be placed. Rather than filling in the entire amount, the City will agree only to allow enough material to create the island. This will be the course of action for this site.

Should riprap or other erosion controls ever become necessary, a permit under Wisconsin Statute 30.12 would be required.

Signing

Signs shall be created and erected on the island to identify the area and to indicate its purpose and ownership. Any restrictions, especially related to trespass, shall be indicated. These signs will be posted around the island at a spacing of roughly 100 feet and should be able to be read by people from a reasonable distance (e.g. 50 feet).

No signing is required in the rest of the management area. It may be added as part of an education and awareness program.

PUBLIC AWARENESS AND EDUCATION

To insure the success of the project, the general public, especially that segment which uses the harbor, must be made aware of the existence of the management area and its purpose. This is advisable during both the developmental and actual management stages. In particular, anglers, birdwatchers, and general recreationists should be told of the enhancement efforts so that they can take full advantage of the added value of the site and be sensitive to the restrictions and precautions necessary for its proper management.

RESEARCH/MONITORING/LONG-RANGE PLANNING

Research and monitoring programs will be needed to evaluate the effectiveness of the project as well as to determine any modifications of the management plan which may be required. These programs will also provide information required to determine when future habitat modifications are needed. These monitoring and evaluation programs should be performed on an annual basis by the managing agencies and/or in cooperation with the local universities or other parties deemed acceptable by the managing agencies.

IMPLEMENTATION

Implementing the Wisconsin Grassy Point management plan hinges directly on the ability of the City of Superior and the Wisconsin DNR to reach agreement on this plan and related actions at Barkers Island. It would be correct to say that this plan represents a trade-off between the two sites; the trade is enhanced by the facts that Barkers has not worked as a nesting site and the Grassy Point site has high potential for success.

The major steps in establishing and developing the area are:

1. Designation - the WDNR must formally designate the entire parcel as a state wildlife management area.

2. Ownership - one of two courses of action can be taken. One is for the City to obtain full ownership and by agreement grant control to the WDNR. The other is for the City to assist the WDNR in obtaining fee title ownership.

3. Management agreement - the most critical step is the execution of a management agreement between the City and the WDNR. Such an agreement is essential because of the need to coordinate the development of this area with related actions at Barkers Island; the ownership matter may also have to be covered by the agreement. Key components of the agreement would include:

    a. assurances that the Wisconsin Grassy Point site with the island creation will happen;

    b. assurances that Barkers Island will be de-designated and returned to full City control;

    c. identification of actions to be taken by the City to protect the grass of Parnassis on Barkers as well as to provide some "natural" areas, including shoreline, for use by birds;

    d. definition of initial and on-going management responsibilities at Barkers Island, if any, and at Grassy Point;

    e. establishment of a time table by which all of the above is to occur so that both parties may commence their portion of the work.

Appendix F

CONSTRUCTION CONSIDERATIONS

The engineering firm of Larsen, Harvala & Berquist was retained to generate preliminary construction and cost information for the proposed new island. Their report is enclosed.

At the time this work was done, two possible sites were under consideration. It should also be noted that the Wisconsin Grassy Point site has been shifted westward since the engineers reviewed it.

LARSEN, HARVALA & BERQUIST, INC.

Engineers and Architects
322 W. Michigan Street • Duluth, MN 55802 • (218) 727-8446
Lauren A. Larsen • Harvey H. Harvala • Robert A. Berquist

May 31, 1985

Mr. John Powers
Arrowhead Regional Development Commission
330 South First Avenue East
Duluth, MN 55802

Dear John:

This is our report to describe methods and to provide cost estimates for the construction of an island in the Superior harbor, one to three acres in area, to create habitat for colonial birds.

Two potential sites are considered, located as shown on the attached partial harbor charts.

The island will be created by the deposition of soil material on the existing harbor bottom. The selection of this material will be based on the following criteria:

1. Submerged settleability characteristics and lack of contaminants to avoid water pollution.

2. Internal soil friction characteristics to allow a suitable angle of repose for the perepheral embankment.

3. Ability to support appropriate plant materials for bird habitat.

Materials meeting these criteria are readily available, either as products of harbor dredging or from upland stockpiles within a reasonable distance from both sites. Examples of possible upland material sources include the Erie Pier dredge disposal site in Duluth operated by the U.S. Army Corps of Engineers and the City of Superior stockpile on Connor's Point.

The following methods of construction have been considered:

1. Using the site as an alternate disposal area for a harbor dredging project. This would require careful advance planning and coordination. Examples of such projects include annual harbor maintenance dredging by the U.S. Army Corps of Engineers and cargo slip improvement currently being proposed at the Meehan Seaway Services property on Connor's Point.

2. Material obtained from an upland stockpile, transported by truck and deposited on the ice during the winter season.

3. A special dredging project created only for island construction.

If water depth at the site is six feet or more, mechanically dredged material can be transported directly to the site by barge and unloaded with a "clamshell". Otherwise, material must be unloaded from a barge into a hopper attached to a floating pipeline, then transported by pumping over shallow water to the site. Hydraulically dredged material could, of course, be pumped directly from the dredge through a floating pipeline to the site.

Shape of the surface must await final site and size selection since it depends on factors including topography of the existing lake bottom, proximity to the shipping channel and surrounding shoreline, erosion control, habitat and adjacent navigational considerations. Some various possible shapes are shown on the attached plans. Reasonable variation in configuration will not have a significant effect on construction cost.

Elevation of the top of the peripheral embankment will be at least six feet above low water datum to minimize the effect of "overtopping" by wind and/or ship generated waves. Habitat authorities suggest that the top surface slope should be approximately 1:30. Slope angle for an unprotected peripheral embankment will remain stable at 1:4 based on experience in the harbor with similar material. The enclosed island cross section illustrates these elevations and slopes.

Erosion from channel currents as well as from wind and ship generated waves may be a consideration, especially on the harbor side at either site. Since there will be no important structures to protect and experience with sheltered and man-made islands in the harbor indicates that shoreline recession can be imperceptibly slow, a decision to require embankment protection should await final site selection. For estimating purposes a "riprap" revetment system illustrated on the attached sketch has been developed.

Compressibility of the existing soils at the site could result in island settlement. Testing will be required prior to final design.

Before proceeding to final design, permit requirements and procedures should be discussed with the U.S. Army Corps of Engineers, the U.S. Coast Guard, the Wisconsin Department of Natural Resources, and the City of Superior.

Budget construction cost estimates are enclosed for one and three acre islands, and with each of the three methods discussed above. Existing water depth has been chosen as four feet , which represents an average for the two sites. Costs will vary appreciably with changes in depth since both access by water and material quantities are effected. Hydraulic transport from a mechanical dredging project has been assumed for both methods one and three to be consistent with the chosen depth of four feet.

Estimated quantities of riprap are arbitrary for reasons discussed above. Higher total project costs using riprap can be partially offset since the larger slope angle of the peripheral embankment will result in less total material required.

Earthwork unit prices will vary inversely with quantity for methods one and three since the significant mobilization costs remain constant.

The broad range of estimated costs ($129,000 to $530,000) can be reduced using appropriate unit prices, once site and budget considerations are better defined.

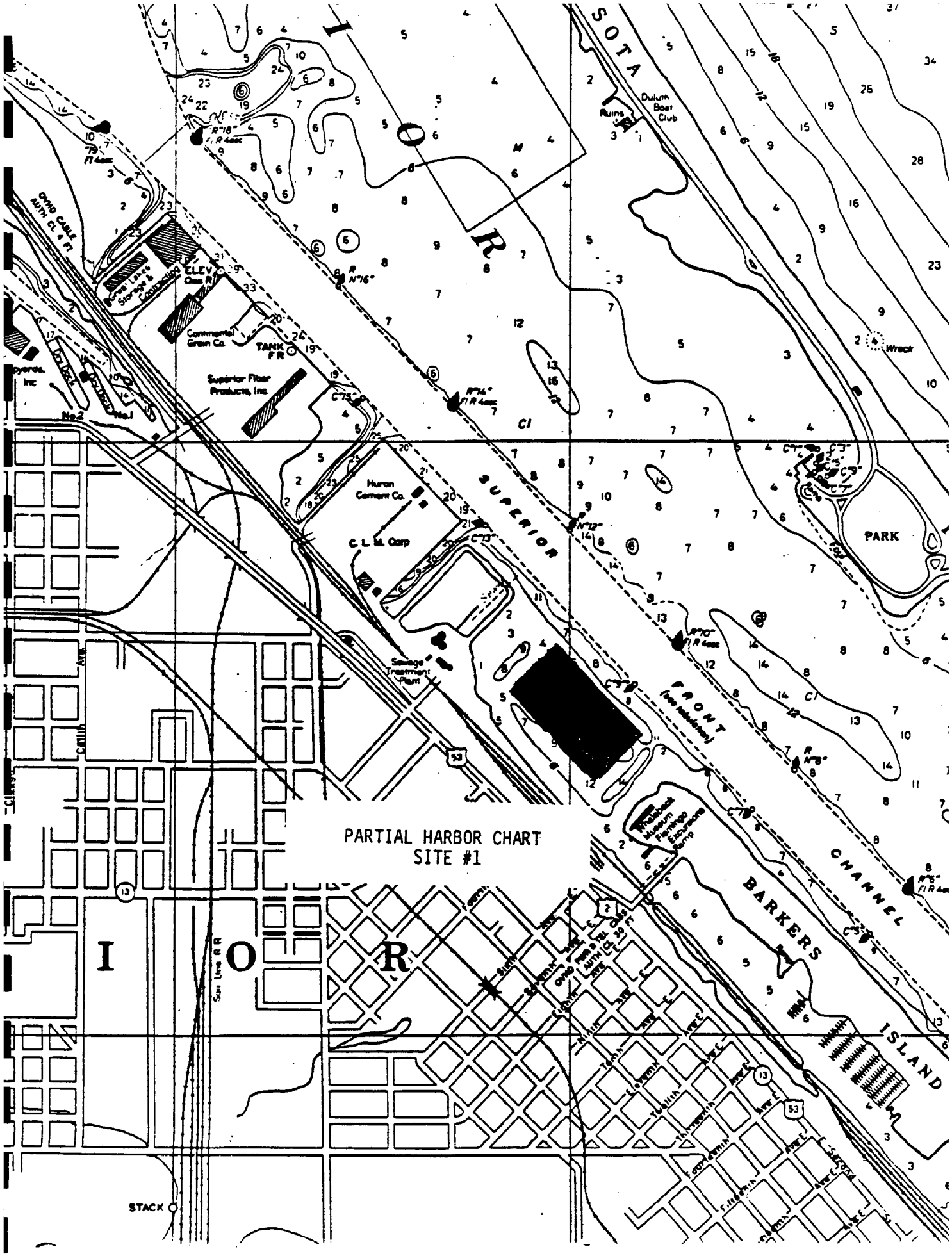
I hope this information is sufficient for your needs. Please call if you have any questions.

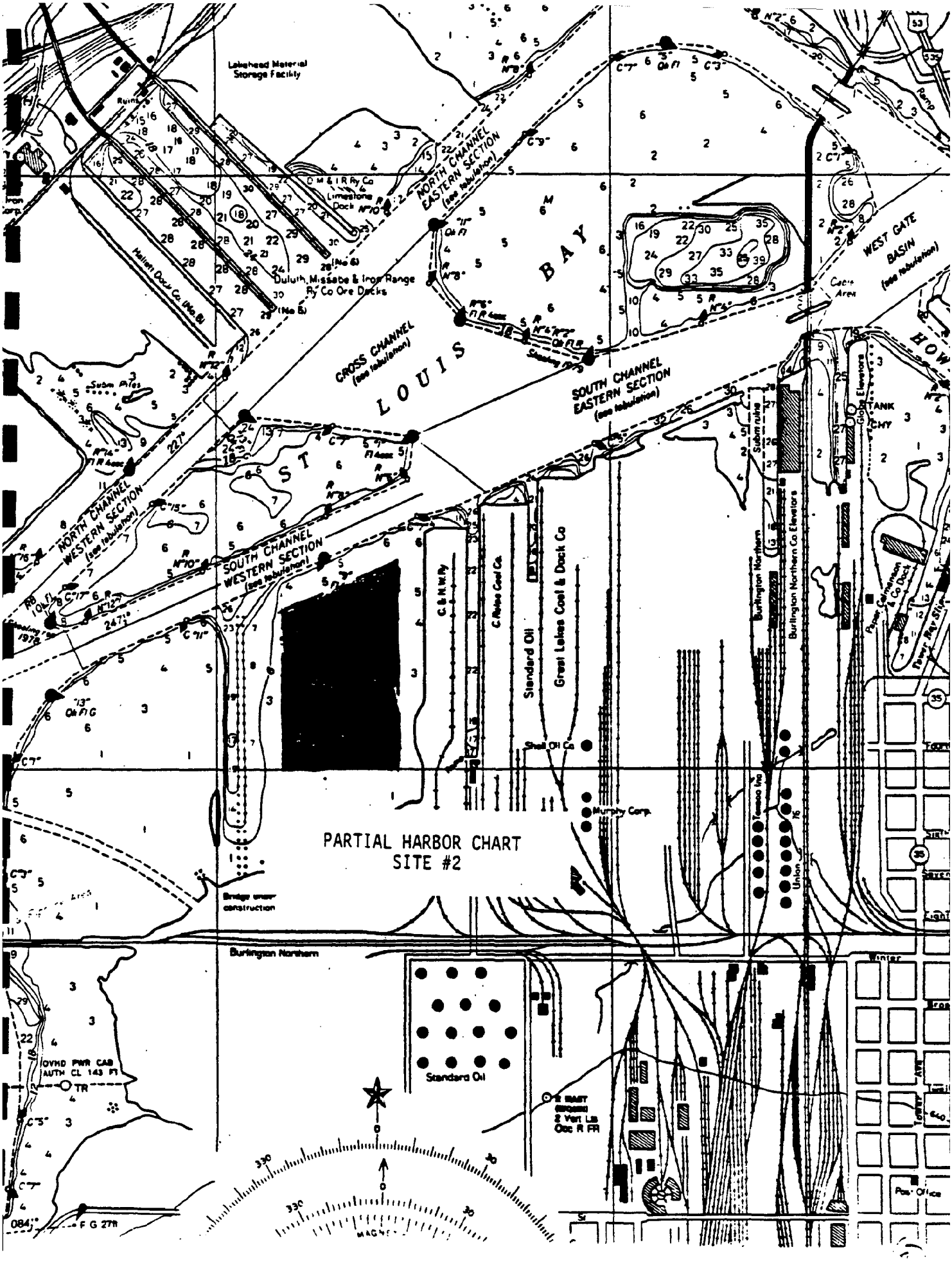
Best regards,

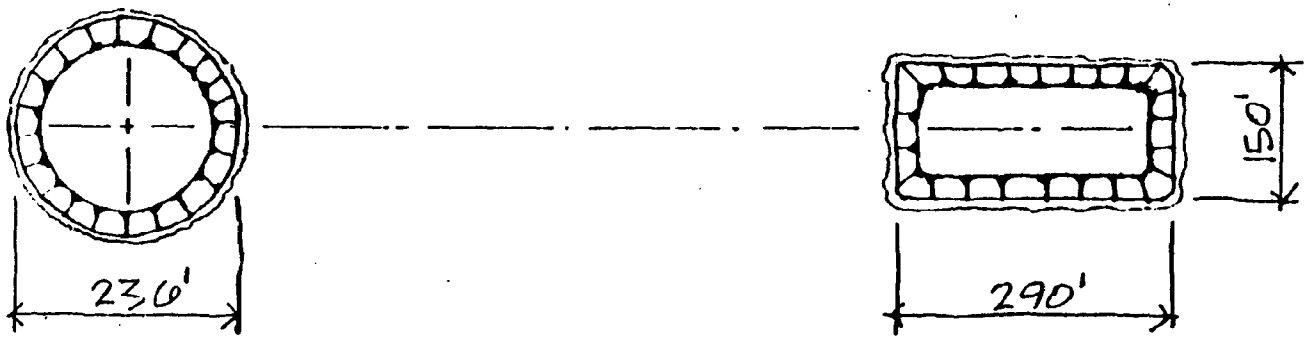
LAUREN

Lauren A. Larsen
President

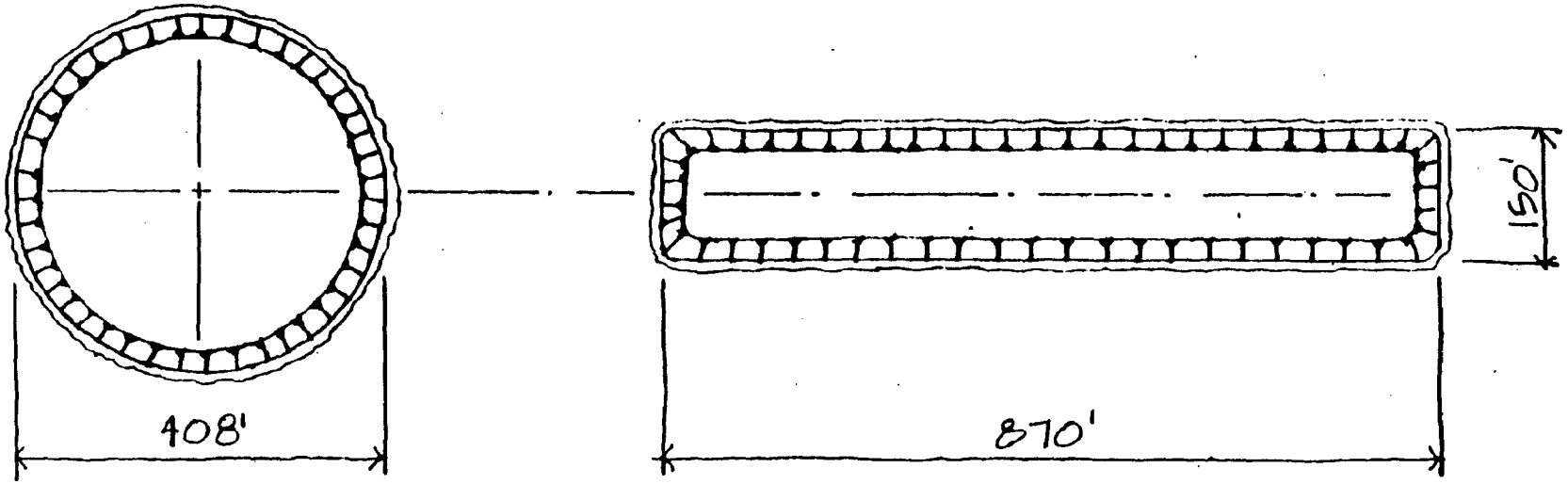
Enclosures


SOTA
Duluth Boat Club
Ruins
Wreck
PARK
SUPERIOR
FRONT
(Now Industrial)
CHANNEL
BARKERS
ISLAND
Superior Fiber Products, Inc.
Commercial Grain Co.
TANK FR
ELEV
Huron Cement Co.
C. L. M. Corp
Sewage Treatment Plant
Wisconsin Museum Fleming Excursions Ramp
Soo Line R.R.
STACK
PARTIAL HARBOR CHART
SITE #1

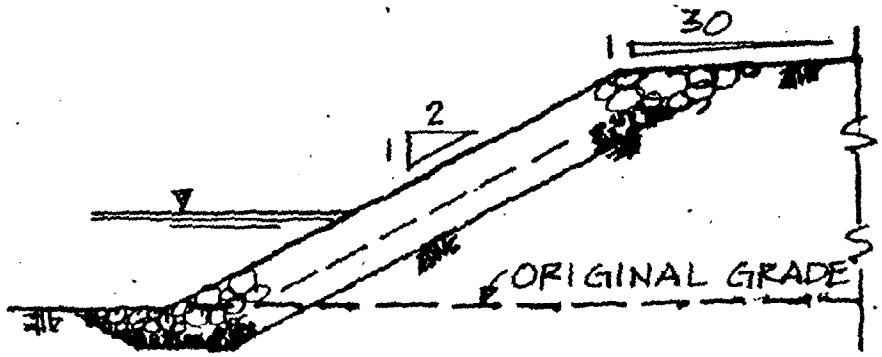

Lakehead Material Storage Facility
Ruins
Duluth, Missabe & Iron Range Ry Co Ore Docks
Limestone Dock
Mallard Dock Co. (No. 6)
NORTH CHANNEL EASTERN SECTION (see tabulation)
CROSS CHANNEL (see tabulation)
LOUIS BAY
WEST GATE BASIN (see tabulation)
SOUTH CHANNEL EASTERN SECTION (see tabulation)
NORTH CHANNEL WESTERN SECTION (see tabulation)
SOUTH CHANNEL WESTERN SECTION (see tabulation)
C.B.N.W.Ry
C. Reiss Coal Co.
Standard Oil
Great Lakes Coal & Dock Co
Shell Oil Co
Burlington Northern
Burlington Northern Co Elevators
Pioneer Carriers & Co Dock
Tower Ave Slip
Murphy Corp
Tenneco Inc
Union
PARTIAL HARBOR CHART
SITE #2
Bridge under construction
Burlington Northern
Standard Oil
OVHD PWR CAB AUTH CL 143 FT
TR
Winter
Pass Office
MAGNETIC



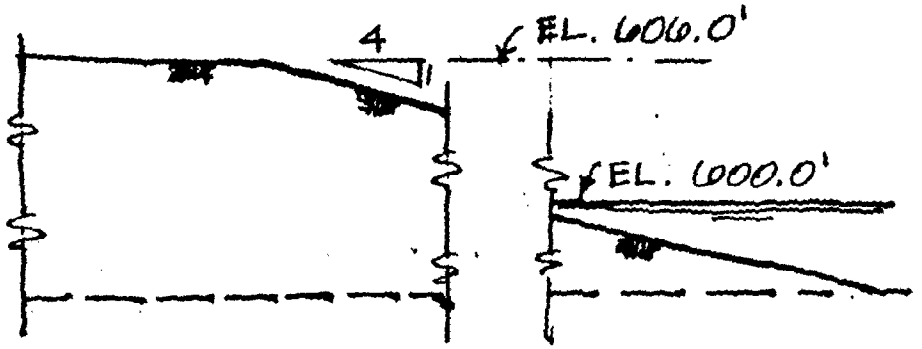
ONE ACRE ISLAND PLANS



THREE ACRE ISLAND PLANS

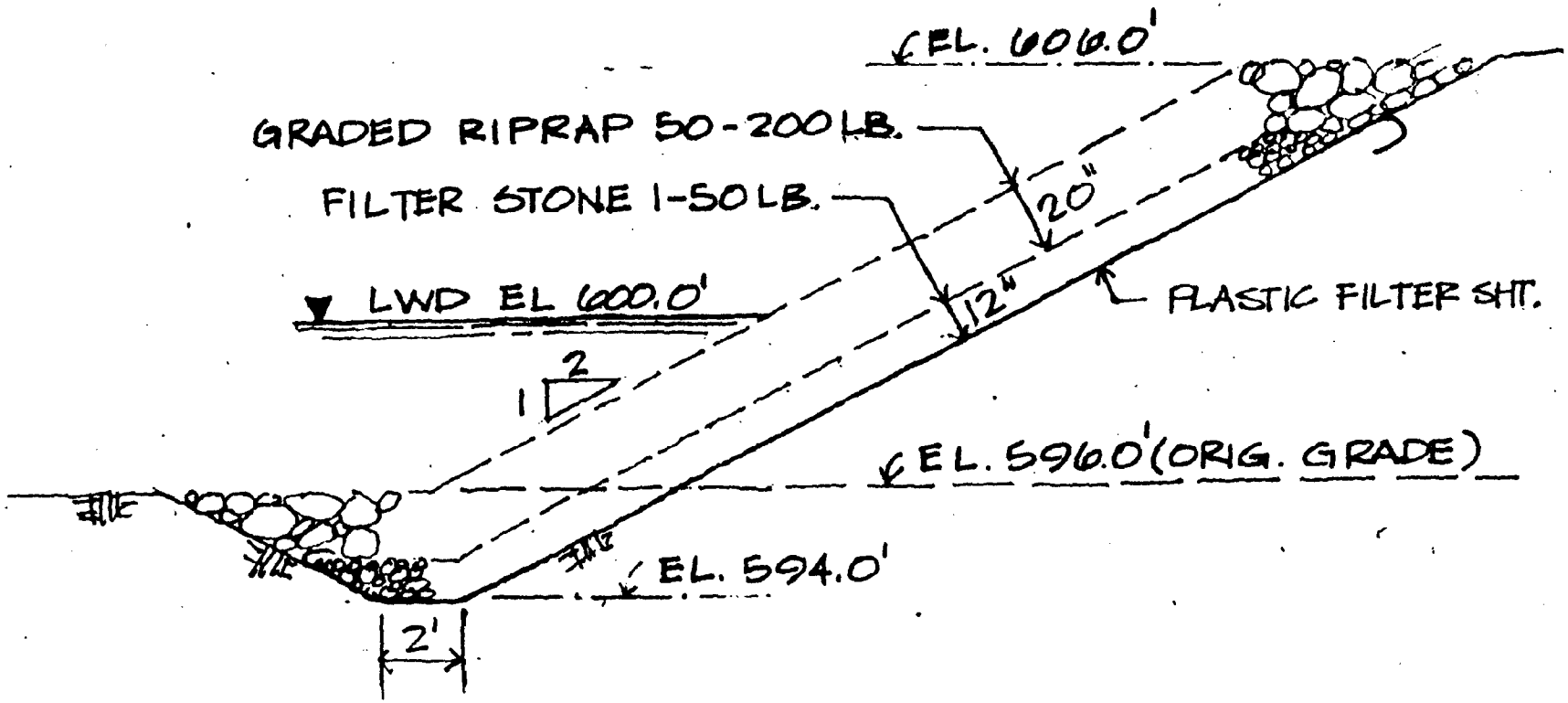


PROTECTED EMBANKMENT



UNPROTECTED EMBANKMENT

ISLAND CROSS SECTION



EMBANKMENT PROTECTION
TYPICAL CROSS SECTION

LARSEN, HARVALA & BERQUIST, INC.

Engineers and Architects
322 W. Michigan Street • Duluth, MN 55802 • (218) 727-8446
Lauren A. Larsen • Harvey H. Harvala • Robert A. Berquist

HARBOR ISLAND
CONSTRUCTION COST ESTIMATE

1 ACRE ISLAND (16,000 CUBIC YARDS)

	METHOD 1	METHOD 2	METHOD 3
Earthwork	$104,000 (1)	$64,000 (2)	$184,000 (3)
Engineering & Testing	25,000	25,000	25,000
Sub-Total	$129,000	$89,000	$209,000
Rip Rap (6)	60,000	60,000	60,000
TOTAL	$189,000	$149,000	$269,000

3 ACRE ISLAND (47,000 CUBIC YARDS)

Earthwork	$165,000 (4)	$188,000 (2)	$400,000 (5)
Engineering & Testing	25,000	25,000	25,000
Sub-Total	$190,000	$213,000	$425,000
Rip Rap (7)	105,000	105,000	105,000
TOTAL	$295,000	$318,000	$530,000

(1) $6.50 per cubic yard
(2) $4.00 per cubic yard
(3) $11.50 per cubic yard
(4) $3.50 per cubic yard
(5) $8.50 per cubic yard
(6) 400 linear feet @ $150/lf
(7) 700 linear feet @ $150/lf